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* Stephen Smith, M.D. 1872, 1873, 1874
* Joseph M. Toner, M.D. 1875
* Edwin M. Snow, M.D. 1876
* John H. Rauch, M.D. 1877
* Elisha Harris, M.D. 1878
* James L. Cabell, M.D. 1879
* John S. Billings, M.D. 1880
* Charles B. White, M.D. 1881
* Robert C. Kedzie, M.D. 1882
* Ezra M. Hunt, M.D. 1883
* Albert L. Gihon, M.D. 1884
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* Henry P. Walcott, M.D. 1886
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* Frederick Montizambert, M.D. 1891
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* Emmanuel P. Lachapelle, M.D. 1894
* William Bailey, M.D. 1895
* Eduardo Liceaga, M.D. 1896
* Henry B. Horlbeck, M.D. 1897
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* Henry Mitchell, M.D. 1899
* Peter H. Bryce, M.D. 1900
* Benjamin Lee, M.D. 1901
* Henry D. Holton, M.D. 1902
* Walter Wyman, M.D. 1903
* Carlos J. Finlay, M.D. 1904
* Frank F. Wesbrook, M.D. 1905
* Franklin C. Robinson, LL.D. 1906
* Domingo Orvananos, M.D. 1907
* Richard H. Lewis, M.D. 1908
* Gardner T. Swarts, M.D. 1909
* Charles O. Probst, M.D. 1910
* R. M. Simpson, M.D. 1911
* J. N. Hurty, M.D. 1912
* Rudolph Hering, Sc.D. 1913
* W. C. Woodward, M.D. 1914
* W. T. Sedgwick, Sc.D. 1915
John F. Anderson, M.D. 1916
* W. A. Evans, M.D. 1917
* C. J. Hastings, M.D. 1918
* Lee K. Frankel, Ph.D. 1919
W. S. Rankin, M.D. 1920
* Mazÿck P. Ravenel, M.D. 1921
A. J. McLaughlin, M.D. 1922
* E. C. Levy, M.D. 1923
* W. H. Park, M.D. 1924
Henry F. Vaughan, Dr.P.H. 1925
C.-E. A. Winslow, Dr.P.H. 1926
* Charles V. Chapin, M.D. 1927
Herman N. Bundesen, M.D. 1928
* George W. Fuller 1929
A. J. Chesley, M.D. 1930
* Hugh S. Cumming, M.D. 1931
Louis I. Dublin, Ph.D. 1932
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Haven Emerson, M.D. 1934
* Eugene L. Bishop, M.D. 1935
Walter H. Brown, M.D. 1936
Thomas Parran, M.D. 1937
* Arthur T. McCormack, M.D. 1938
Abel Wolman, Dr.Eng. 1939
Edward S. Godfrey, Jr., M.D. 1940
* W. S. Leathers, M.D. 1941
John L. Rice, M.D. 1942
Allen W. Freeman, M.D. 1943
Felix J. Underwood, M.D. 1944
* John J. Sippy, M.D. 1945–1946
Harry S. Mustard, M.D. 1947
Martha M. Eliot, M.D. 1948
Charles F. Wilinsky, M.D. 1949
Lowell J. Reed, Ph.D. 1950
William P. Shepard, M.D. 1951
Gaylord W. Anderson, M.D. 1952
Wilton L. Halverson, M.D. 1953

* Deceased

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1929 Charles V. Chapin, M.D.*
1930 Theobald Smith, M.D.*
1931 George W. McCoy, M.D.*
1932 William H. Park, M.D.*
1933 Milton J. Rosenau, M.D.*
1934 Professor Edwin O. Jordan*
1935 Haven Emerson, M.D.
1936 Frederick F. Russell, M.D.
1937 No award
1938 Wade H. Frost, M.D.*
1939 Thomas Parran, M.D.
1940 Hans Zinsser, M.D.*
1941 Charles Armstrong, M.D.
1942 C.-E. A. Winslow, Dr.P.H.
1943 Brig. Gen. James S. Simmons, M.C.
1944 Ernest W. Goodpasture, M.D.
1945 No award
1946 Karl F. Meyer, M.D.
1947 Reginald M. Atwater, M.D.
1948 Abel Wolman, Dr.Eng.
1949 Henry F. Vaughan, Dr.P.H.
1950 Rolla Eugene Dyer, M.D.
1951 Edward S. Godfrey, Jr., M.D.
1952 Kenneth F. Maxcy, M.D.

* Deceased

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The American Public Health Association, through the presentation of the Albert and Mary Lasker Foundation Awards, acknowledges outstanding contributions to scientific research related to diseases which are the most frequent causes of death and disability, and for distinguished services in the field of public health.

The Lasker Awards for 1946 were conferred upon:

Dr. Carl Ferdinand Cori
Dr. Alexander S. Weiner, Dr. Philip Levine, and Dr. Karl Landsteiner (posthumously)
Dr. John Friend Mahoney
Dr. Alfred Newton Richards
Dr. Fred L. Soper

The following groups were cited:

The Army Epidemiological Board
The Board for the Coordination of Malarial Studies
The Bureau of Entomology and Plant Quarantine
The National Institute of Health
The Northern Regional Research Laboratory

The Lasker Awards for 1947 were conferred upon:

Dr. Oswald T. Avery
Dr. Thomas Francis, Jr.
Dr. Homer Smith
Dr. Alice Hamilton
Dr. Thomas Parran

The following groups were cited:

The British Ministries of Food and Health
The United States Committee on Joint Causes of Death

The Lasker Awards for 1948 were conferred upon:

Dr. Selman A. Waksman and Dr. Rene J. Dubos, jointly
Dr. Vincent du Vigneaud
Dr. Martha M. Eliot
Dr. R. E. Dyer

The following group was cited:

The Department of Medicine and Surgery, Veterans Administration, and especially Dr. Paul R. Hawley and Dr. Paul B. Magnuson

The Lasker Awards for 1949 were conferred upon:

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Dr. Andre Cournand
Marion W. Sheahan, R.N.
Dr. Max Theiler
Dr. William S. Tillett and Dr. L. R. Christensen, jointly
Dr. Edward C. Kendall and Dr. Philip S. Hench, jointly

The following groups were cited:

The American Academy of Pediatrics
The Life Insurance Medical Research Fund

The Lasker Awards for 1950 were conferred upon:

Dr. George Wells Beadle
Dr. Eugene L. Bishop
Dr. George Papanicolaou

The following group was cited:

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Dr. Catharine Macfarlane
Dr. Karl F. Meyer
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Health Insurance Plan of Greater New York

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Dr. Howard A. Rusk
Dr. F. Macfarlane Burnet
Dr. Conrad A. Elvehjem
Dr. Frederick S. McKay and Dr. H. Trendley Dean, jointly
Dr. C.-E. A. Winslow

ANNUAL MEETINGS

Preliminary	Meeting		New York, N. Y., April 18	1872
"	"		Long Branch, N. J., September 12	1872
1st	Annual	Meeting	Cincinnati, O., May 1–3	1873
2d	"	"	New York, N. Y., November 11–14	1873
3rd	"	"	Philadelphia, Pa.	1874
4th	"	"	Baltimore, Md.	1875
5th	"	"	Boston, Mass.	1876
6th	"	"	Chicago, Ill.	1877
7th	"	"	Richmond, Va.	1878
8th	"	"	Nashville, Tenn.	1879
9th	"	"	New Orleans, La.	1880
10th	"	"	Savannah, Ga.	1881
11th	"	"	Indianapolis, Ind.	1882
12th	"	"	Detroit, Mich.	1883
13th	"	"	St. Louis, Mo.	1884
14th	"	"	Washington, D. C.	1885
15th	"	"	Toronto, Ont.	1886
16th	"	"	Memphis, Tenn.	1887
17th	"	"	Milwaukee, Wis.	1888
18th	"	"	Brooklyn, N. Y.	1889
19th	"	"	Charleston, S. C.	1890
20th	"	"	Kansas City, Mo.	1891
21st	"	"	Mexico City, Mex.	1892
22d	"	"	Chicago, Ill.	1893
23d	"	"	Montreal, Que.	1894
24th	"	"	Denver, Colo.	1895
25th	"	"	Buffalo, N. Y.	1896
26th	"	"	Philadelphia, Pa.	1897
27th	"	"	Ottawa, Ont.	1898
28th	"	"	Minneapolis, Minn.	1899
29th	"	"	Indianapolis, Ind.	1900
30th	"	"	Buffalo, N. Y.	1901
31st	"	"	New Orleans, La.	1902
32d	"	"	Washington, D. C.	1903
33d	"	"	Havana, Cuba	1904
34th	"	"	Boston, Mass.	1905
35th	"	"	Mexico City, Mex.	1906
36th	"	"	Atlantic City, N. J.	1907
37th	"	"	Winnipeg, Man.	1908
38th	"	"	Richmond, Va.	1909
39th	"	"	Milwaukee, Wis.	1910
40th	"	"	Havana, Cuba	1911
41st	"	"	Washington, D. C.	1912
42d	"	"	Colorado Springs, Colo.	1913
43d	"	"	Jacksonville, Fla.	1914
44th	"	"	Rochester, N. Y.	1915
45th	"	"	Cincinnati, O.	1916
46th	"	"	Washington, D. C.	1917
47th	"	"	Chicago, Ill.	1918
48th	"	"	New Orleans, La.	1919
49th	"	"	San Francisco, Calif.	1920
50th	"	"	New York, N. Y.	1921
51st	"	"	Cleveland, O.	1922
52d	"	"	Boston, Mass.	1923
53d	"	"	Detroit, Mich.	1924
54th	"	"	St. Louis, Mo.	1925
55th	"	"	Buffalo, N. Y.	1926

ANNUAL MEETINGS (Cont.)

56th	"	"	Cincinnati, O.	1927
57th	"	"	Chicago, Ill.	1928
58th	"	"	Minneapolis, Minn.	1929
59th	"	"	Fort Worth, Tex.*	1930
60th	"	"	Montreal, Que.	1931
61st	"	"	Washington, D. C.	1932
62d	"	"	Indianapolis, Ind.	1933
63d	"	"	Pasadena, Calif.	1934
64th	"	"	Milwaukee, Wis.	1935
65th	"	"	New Orleans, La.†	1936
66th	"	"	New York, N. Y.	1937
67th	"	"	Kansas City, Mo.	1938
68th	"	"	Pittsburgh, Pa.	1939
69th	"	"	Detroit, Mich.	1940
70th	"	"	Atlantic City, N. J.	1941
71st	"	"	St. Louis, Mo.	1942
72d	"	"	(Wartime Conference) New York, N. Y.	1943
73d	"	"	(Wartime Conference) New York, N. Y.	1944
			No Meeting	1945
74th	"	"	Cleveland, O.	1946
75th	"	"	Atlantic City, N. J.	1947
76th	"	"	Boston, Mass.	1948
77th	"	"	New York, N. Y.‡	1949
78th	"	"	St. Louis, Mo.	1950
79th	"	"	San Francisco, Calif.	1951
80th	"	"	Cleveland, O.	1952

* Post-Convention Meeting, Mexico City, Mex., 1930.
† Post-Convention Meeting, Havana, Cuba, 1936.
‡ Post-Convention Meeting, Bermuda Cruise, 1949.

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The Association acknowledges with deep appreciation its indebtedness to its Sustaining Members whose annual dues help support the Association's general program

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Scientific Exhibit Citations — Cleveland Annual Meeting

At the 80th Annual Meeting in Cleveland, 47 exhibitors participated in the Scientific Exhibit.

The Subcommittee on Evaluation, Andie L. Knutson, Ph.D., chairman, continued for the fourth year a scoring project using objective criteria developed by the committee. Fifteen members of the Association, recruited from the Public Health Education Section, served as observers of the exhibits. Each observer evaluated 9 or 10 exhibits and each exhibit was evaluated by three observers. The collected data were compiled and analyzed by Dr. Knutson and members of the Committee on Scientific Exhibits, aided by four staff members of the Cleveland Division of Health. A summary of the detailed questionnaire and the points allowed each item follow:

1. Is it physically possible to read the exhibit from the point of observation? 10 points
2. Will all graphs, charts and diagrams be clearly understood by the intended audience? Has the use of statistical presentation been kept at a minimum? 10 points
3. Is the vocabulary and style of writing used such that the intended audience can comfortably follow and understand the exhibit? ..... 10 points
4. Does the exhibit sustain interest long enough to be read completely? 10 points
5. Supplementary items (qualified attendant present, visual aids used, visitor-operated devices used and contributing to exhibit, literature supporting the exhibit objectives) ..... 10 points
6. Does the exhibit impart the message that it is desired to impart? (This involved comparison with the statements of the objectives of each exhibit as given by the observers and the exhibitors) 25 points

7a. Does the exhibit tie in with the interests of the visitor? ..... 10 points

7b. Does the exhibit offer the visitor a chance to participate in satisfying a personal purpose? ..... 15 points

On the basis of the data obtained, the committee awarded citations to the following organizations:

American Medical Association
Armed Forces Institute of Pathology
Health Publications Institute
Ohio State Department of Health
U. S. Navy Department Bureau of Medicine and Surgery
West Virginia State Department of Health

The committee also recognized five exhibitors who received awards within the last three years and therefore were not eligible for citations this year. These five, receiving high scores but not eligible for citations, were:

American Dietetic Association
Canadian Department of National Health and Welfare (cited for excellence three years in succession)
Metropolitan Life Insurance Company
National Society for the Prevention of Blindness
Public Health Service—Division of International Health

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American Public Health Association

COMMITTEES

1952–1953

THE ASSOCIATION COMMITTEE LISTS

These pages again bring to the readers the lists of Association officers and committee members. Once again they make a goodly company representing altogether more than 150 committees and other councils, a capable and loyal group of workers.

A certain proportion of the names of those formerly carried on such lists do not appear here. They have the Association's thanks for work well done in other years and for the fine spirit in which they have recognized the fact that, for the sake of the Association and its future effectiveness, leadership must be shared and leaders constantly developed through the assumption of responsibility. Our Association is stronger today because leaders periodically have stepped aside in order that others may step forward to acquire such knowledge as they themselves have gained.

Change in leadership is an accepted policy in the Association. Such a professional society is never strong if an informed few lead many uninformed though loyal followers. A strong association is composed of leaders many of whom could at any time take their turn and lead.

As we gratefully acknowledge the debt to those who have rendered their services as they carried their responsibilities of office, we turn with hope and expectation of other achievements to the men and women who are now to lead.

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Cyrus H. Maxwell, M.D.
Jennelle V. Moorhead
J. Keogh Rash, Hs.D.
Warren H. Southworth, Dr.P.H.

Committee on Rural School Health Services
Arthur F. Davis, Dr.P.H., *Chairman,* 610 W. Beaver St., State College, Pa.
Catherine Kelly
Nina B. Lamkin
Dorothy Nyswander, Ph.D.
Mona Overton, R.N.
J. F. Shull, M.D.
Ellwood Sones
Ralph Tyler, Ph.D.
Robert O. Yoho

Committee on School Health Records
C. Morley Sellery, M.D., *Chairman,* 810 Chamber of Commerce Building, Los Angeles, Calif.
Margaret A. Cree
Robert W. Culbert, M.D.
Ira L. Ferguson, Ph.D.
Charles F. Good, M.D.
Samuel B. McPheeters, M.D.
Perry Sandell

Committee on School Nursing
Florence L. Fogle, R.N., *Chairman,* Ohio State University, Columbus, Ohio
(Personnel to be appointed.)

Committee on School Health Service Statistics
Alan Foord, M.D., *Chairman,* 615 N. Wolfe St., Baltimore 5, Md.
Evelyn Flook
George T. Stafford, Ed.D.
Matthew Taback
Alfred Yankauer, Jr., M.D.

Nominations Committee
Fred V. Hein, Ph.D., *Chairman,* 535 N. Dearborn St., Chicago 10, Ill.
Wesley P. Cushman, D.Ed.
Franklin P. Haar, Ph.D.
Ruth H. Weaver, M.D.

Statistics Section

Joint Committee on Chronic Disease Statistics

Epidemiology Section

Jean Downes, *Chairman,* 40 Wall St., New York 5, N. Y.
Robert Dyar, M.D.
John E. Gordon, M.D.
Philip E. Sartwell, M.D.

Statistics Section

Morton Kramer, D.Sc.
Eschscholtzia L. Lucia, Ph.D.
Herbert H. Marks
Felix E. Moore, Jr.

Joint Committee on Evaluation

Health Officers Section

Archibald S. Dean, M.D.
C. Howe Eller, M.D.
Berwyn F. Mattison, M.D.

Statistics Section

Bernard G. Greenberg, Ph.D., *Chairman,* University of North Carolina School of Public Health, Chapel Hill, N. C.
Robert E. Patton
Matthew Taback

Joint Committee on Medical Care Statistics

Medical Care Section

Franz Goldmann, M.D., *Chairman,* 55 Shattuck St., Boston 15, Mass.
John M. Brumm
Melvin L. Dollar
Jay C. Ketchum
Margaret C. Klem
Charles A. Metzner
Dean W. Roberts, M.D.
C. Rufus Rorem, Ph.D.
Raymond M. Walls, D.D.S.
E. Richard Weinerman, M.D.
Samuel Zibit

Statistics Section

W. Thurber Fales, Sc.D., *Co-Chairman,* Municipal Building, Baltimore, Md.
Isidore Altman
Selwyn D. Collins, Ph.D.
Neva R. Deardorff, Ph.D.
Louis Weiner

Committee on Cooperation with Medical Record Librarians

Ann Dillon, *Chairman,* State Department of Public Health, Nashville, Tenn.
Vivian B. Holland
Margaret P. Martin, Ph.D.
Mary Ellen Patno
M. Loyola Voelker

Committee on Membership and Directory

Clifford H. Greve, *Chairman,* Public Health Service, Washington 25, D. C.
Marjorie T. Bellows
Clara E. Councell, Ph.D.
Marguerite F. Hall, Ph.D.
Elliott H. Pennell
Samuel Shapiro
Iwao M. Moriyama, Ph.D., *Consultant*

Committee on Recruitment of Public Health Statisticians

Margaret F. Shackelford, *Chairman,* 3400 N. Eastern, Oklahoma City 5, Okla.
Rachel Jenss, Sc.D.
Elizabeth M. Macfarlane
Paul W. Shipley

Committee on Sampling Techniques in Public Health Statistics

Theodore D. Woolsey, *Chairman,* Public Health Service, Washington 25, D. C.
William G. Cochran
Donald Mainland
Margaret P. Martin, Ph.D.
Felix E. Moore, Jr.
Robert E. Patton

Representatives of the American Public Health Association to Other Organizations and Committees for 1953

Advisory Council on Medical Education
William P. Shepard, M.D.
Reginald M. Atwater, M.D., *Alternate*

American Association for the Advancement of Science
Morton L. Levin, M.D.
Franklin H. Top, M.D.

American Camping Association
Health and Safety Committee
Francis B. Elder

American Society of Civil Engineers
Joint Committee for the Advancement of Sanitary Engineering
Herman G. Baity, Sc.D.
Clarence I. Sterling, Jr.
A. H. Wieters

American Society of Mechanical Engineers
Air Pollution Control Committee
Arthur C. Stern

American Society for Testing Materials
Committee on Industrial Water, D-19
F. Wellington Gilcreas
Paul W. Kabler, M.D.

Committee on Methods of Atmospheric Sampling and Analysis, D-22
(Representative to be appointed.)

American Standards Association
Building Code Correlating Committee (1952–1953)
J. Lloyd Barron, C.E.

Proposed Project on Hazards to Children
Frederick S. Kent

Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases
Lewis J. Cralley, Ph.D.

Sectional Committee on Bedding and Upholstery—Subcommittee on Sterilization
F. J. Maier

Sectional Committee on Places of Outdoor Assembly
J. Lloyd Barron, C.E.

Sectional Committee on School Lighting
Charles C. Wilson, M.D.

Sectional Committee on the Safety Code for Exhaust Systems, Z-9
Allen D. Brandt, Sc.D.

Sectional Committee on the Safety Code for Industrial Sanitation in Manufacturing Establishments
Sheldon Lang

Sectional Committee on the Safety Code for the Industrial Use of X-Rays, Z-54
Merril Eisenbud

Sectional Committee on Safety in Electric and Gas Welding and Cutting Operations, Z-49
Allen D. Brandt, Sc.D.

Baking Industry Sanitation Standards Committee
Abraham E. Abrahamson

Biological Stain Commission
Edmund K. Kline, Dr.P.H.

Children's Bureau
Committee on Maternal and Child Health and Crippled Children's Services
A. L. van Horn, M.D. (1952–1955)

Chlorine Institute
Public Health Advisory Committee
Francis B. Elder

Committee for the Improvement of Professional Preparation in Health Education, Physical Education and Recreation
Dorothy B. Nyswander, Ph.D.
Charles C. Wilson, M.D., *Alternate*

Council of National Organizations
Ruth E. Grout, Ph.D.

Council on Rheumatic Fever and Congenital Heart Disease
David D. Rutstein, M.D.
George M. Wheatley, M.D.

Inter-Agency Committee for a Uniform Plumbing Code
M. Warren Cowles

Alternates:
William H. Cary, Jr., C.E.
Ralph E. Fuhrman

National Bureau of Standards—Standing Committee on Insect Wire Screening CS-138-49
Wesley E. Gilbertson

National Conference for Cooperation in Health Education
Marjorie L. Craig

National Health Council
Granville W. Larimore, M.D.
Ernest L. Stebbins, M.D.
Dorothy Wilson, Ed.D.

National Research Council
Advisory Panel to the Committee on Food Protection
William J. Darby, M.D.

Food and Nutrition Board, Liaison Representative
Alice H. Smith

National Safety Council
Committee on Films for Safety
Arthur Kneerim

National Security Council
Facilities Protection Board of the Interdepartmental Committee on Internal Security
Task Group on Water Supply
Edward S. Hopkins

Selection Board for World Health Organization Fellowships
Leona Baumgartner, M.D. (1951–1953)

U. S. Department of Agriculture
Poultry Industry Advisory Committee
Earle G. Brown, M.D.
Ferdinand A. Korff
Subtask Group on Public Health Problems
Daniel Bergsma, M.D.
C. C. Potter

U. S. Department of Commerce
Standing Committee for Bituminous Coated Metal Septic Tanks—(Single Compartment, Residential) Commercial Standard 177–51
Joseph A. Salvato, Jr.

U. S. Public Health Service
Advisory Committee on Foreign Students and Visitors
Reginald M. Atwater, M.D.

Committee of Consultants on Critical Materials Needs
William H. F. Warthen, M.D.

Report of the Chairman of the Executive Board of the American Public Health Association to the Governing Council, 1951-1952

THESE twelve months represent a significant interval in our common adventure of building a strong public health association in North America. Ours is a truly dynamic field with a great past, a challenging present and a future with no apparent limits of human service to be rendered. How well have we advanced our cause this year? What tasks have been accomplished? What was left undone? Where have we been truly creative? What opportunities have we missed? What new goals are in sight now? Such are the questions facing the members of the APHA and especially those of us who, as members of the Governing Council, are charged with the responsibility of guiding and directing its program.

With these questions in mind, and looking forward to the 80th Annual Meeting to be held in Cleveland, Ohio, the week of October 20, the affairs of the Association should be reviewed so that the 117 members of the Governing Council may have a background of full information for their discussions.

The purpose of this report is to give the high lights of the year's operation as it has been conducted by the Executive Board, by the Standing Committees, and by the other agencies of the APHA within the policies determined by the Governing Council.

ASSOCIATION POLICY ON A FEDERAL DEPARTMENT OF HEALTH

Members of the Governing Council will remember the extended debate on the place of public health in the federal government which took place in San Francisco (see minutes of meeting of October 31, 1951, page 8). The representatives of the Association appearing in Washington were instructed to support a Federal Department of Health and to oppose departmental status for the Federal Security Agency.

The Executive Board, in conformity with this policy, has consistently stated the Association's position on each occasion.

MEMBERSHIP RECORD

The membership of the Association as of September 1, 1952, stood at 12,968. This figure is gratifying in view of the changes in dues effective this year.

Members of the Governing Council will recall that, on recommendation of the Executive Board a year ago, the Council raised the Association dues, effective January 1, 1952, so that Fellowship dues would be $15 per annum and membership dues $10, both inclusive of a subscription to the *American Journal of Public Health*. The Council will wish to know what the experience has been during 1952 with this new dues structure.

Our members and Fellows are realistic persons who recognize that the Association cannot preserve immunity from the inflationary spiral in which our North American economy is involved. The public health professions by and large are not highly paid, but it is encouraging that the continuity of support of the professional society has not been weakened this year. In fact, in a num-

ber of respects it has been expanded. Between January 1 and September 1, 1952, 840 new members have been added to the roster. The following table tells the story:

APHA MEMBERSHIP RECORD

	January 1–August 31	
	1951	*1952*
New members added	944	840
Rejoining after lapse in membership	123	156
Resignations	287	527
Dues unpaid	945	1,136
Income from membership dues	$96,955.52	$126,680.77

December 31 will probably show a net loss in members for the year.

The Executive Board has been specifically concerned during the year with the wise allocation of Association funds and it is our belief that a much sounder structure is now possible under the present dues schedule, having in mind the very considerable backlog of useful projects which have been awaiting the allocation of funds from the APHA budget.

The growth in membership of a professional society such as the American Public Health Association is seldom spectacular, although large increases, unfortunately sometimes only temporary, may result from vast expenditures of time and money. The past twenty years of Association history show a slow but steady increase in the number of members, from 4,500 in 1932 to 7,200 in 1942 to 12,968 on September 1, 1952. The 10,000 mark was reached in 1946, 11,000 in 1947, and 12,000 in 1950. Since 1950 we have approached and even gone over the 13,000 figure on two or three occasions, but it is a difficult hurdle to get over permanently, due to the lapsed members that pull the total figure down at the end of each calendar year.

The number of Fellows on September 1 was 2,620, and 234 are pending election at this Annual Meeting. The Association now has 482 Life Members, 14 having applied during the current year. The remaining categories are Sustaining Members 51, Honorary Fellows 29, Affiliated Societies 32. No Affiliated Society applications are pending.

After overtaking the Health Officers Section in the number of members (not Fellows), the Laboratory Section has now fallen slightly behind. The Public Health Nursing and Public Health Education Sections have been running neck and neck for years, with the former Section ahead in members but not in Fellows. The Medical Care Section is now sixth in size, although it is the youngest Section.

PROGRESS REPORT ON TRENDS AND POLICIES

Before the 1951 Annual Meeting, members of the Governing Council were asked by the Executive Board to comment as individuals, by mail, upon a report of a Committee on Trends and Policies, under the chairmanship of Lowell J. Reed, Ph.D.

The chairman reported to the Council at its second meeting in San Francisco on the 15 replies that had been received.

The report was circulated immediately after the Annual Meeting the second time by mail to Council members who had failed to respond and to newly elected members.

At the first meeting of the Executive Board in 1952, an analysis of the total of 38 letters received from Governing Council members was studied. The conclusion was reached that there was a need to reduce generalities to specifics, and to narrow the area of discussion to a few issues at a time. The letters pointed up, too, the desirability of involving many more persons than the members of the Executive Board and the Governing Council.

After careful consideration, the Board selected the basic issues of the character of the Association, its core activities and its membership for the substance of its first query, asking the entire membership to express itself. The major portion of a *News Letter* sent to members early in June was devoted to the background of the search for sound future directions; such agreements as the discussions of the Executive Board and the Governing Council exhibited; and the present status of the Association with relation to each of the three selected issues. A questionnaire accompanied the *News Letter*. It stated the issues and offered alternatives.

As of September 10, slightly more than 1,100 questionnaires had been returned, representing 9 per cent of the membership. Statistics, Epidemiology, Health Officers, Food and Nutrition, and Medical Care Sections carry off the honors thus far for response.

More than 11 per cent of the membership of the first three have replied, more than 10 per cent of the other two. School Health and Engineering approach 9 per cent; Public Health Education, Industrial Hygiene, Laboratory and Maternal and Child Health hover around 8 per cent; Dental Health stands at 7 per cent and the Public Health Nursing Section is lowest with 5.3 per cent returns.

The Executive Board requested that time be allowed by each Section during the Annual Meeting for consideration of trends and policies and all Sections have complied. The returned questionnaires have been tabulated and analyzed Section by Section and the results placed in the hands of the Section Councils and the persons designated to lead the discussions. A present or past member of the Board will attend each discussion period, at the request of the Section secretaries, to answer questions and to offer interpretations when called upon. Results of Section discussions will be brought back to the Executive Board, where they will be studied as a basis for future recommendations to the Governing Council.

It is to be emphasized that the present questionnaire, focusing upon the character of the Association, its core activities and its membership, is one of a series. Others on different issues, but similiarly limited in scope, will follow.

Of these 1,100, preliminary tabulations have been made of replies from several Sections. Thus far the great majority want the Association to remain a professional society and want its core activities continued. No one would change its basic character to an organization with a membership preponderantly nonprofessional. Some see the participation of nonprofessional persons as essential in advancing public health, accenting the word "public." Only two persons so far advocate a membership in which nonprofessionals might be as high as 75 per cent of the total; three persons would go as far as 50–50. For the group advocating citizen participation, 90 per cent professional to 10 per cent nonprofessional appears to be the common ground. Control in professional hands, however, is the almost universal opinion.

The core activities are obviously generally acceptable. There are numerous suggestions for improving, expanding, or curtailing specific activities and these have implications for the Sections, the Editorial Board, the Program Committee, and the Standing Committees and will be considered by the appropriate groups.

There are wide divergencies of opinion as to whether there should be distinction among professional members by grades of responsibility or by qualifications. Distinction by qualifications holds a lead over no distinction whatever among professional members—54 to 46 per cent. Distinction by responsibility

appeals to only one-third of those reporting.

So far in the tabulation those who would have uniform dues for all professional members outnumber two to one those who would have distinction in dues.

A number of persons expressed personal pleasure at the opportunity to answer the questionnaire and satisfaction that the membership is being consulted as a basis for building for the future.

INTER-AMERICAN RELATIONSHIPS OF THE APHA

The current year has seen an extension of the Association's long-standing interest in the development of professional society services in the Western Hemisphere. As long ago as 1884 the Association invited Canada to join and in 1891 the Constitution was revised to permit the inclusion of Mexico. The current year marks the completion of fifty years since Cuba formally became identified with the Association, thus uniting most of North America in a single multiprofessional organization.

More than sixty years ago an invitation was extended to the Central American countries and to Colombia to consider joining with the APHA. Although this gesture did not result in a favorable response, there has continued an interest in the international aspects of public health with the underlying belief that there were values in building as many bridges of understanding as are possible.

The Executive Board considered this matter rather fully at its February meeting in the light of explorations made by the executive secretary during a visit to a dozen Latin American countries in preceding months. The Board concluded that channels of cooperation between the APHA and public health associations in Latin American countries should be made easy through the encouragement of the publication of United States texts in Spanish and Portuguese, through exchange of literature, through exchange of visits, through encouragement of Latin American delegates to attend the Annual Meeting, and possibly through teams of speakers organized under Association auspices.

In line with these policies it has been arranged for our president, Dr. Gaylord Anderson, to attend the First Pan American Congress of Public Health which is meeting in Havana under the auspices of the Cuban Government and the Pan American Sanitary Bureau at the end of September. This First Congress commemorates the Fiftieth Anniversary of the Pan American Sanitary Bureau which for the last three years has been also the Regional Office for the Americas of the World Health Organization. Liaison with several other interested organizations is being maintained in order that an eventual solution may be found to the problem of adequate coverage by professional societies of this part of the world.

INTER-ASSOCIATION COMMITTEE ON HEALTH

During another year quarterly meetings of the Inter-Association Committee representing the six professional societies most concerned with our field have brought together the officials of the American Medical Association, the American Hospital Association, the American Dental Association, the American Nurses' Association, and the American Public Welfare Association with our officers to consider the common ground between the organizations. The emphasis during the current year has been less on the adoption of formal statements of agreement and more on informal understandings on such matters as proposed legislation leading to local health units for the nation, the support of professional education for

public health workers and the expansion of the nursing professions. On the whole it seems to your representatives that the Inter-Association Committee continues to provide a useful occasion for better understanding even though there can hardly be expected to be unanimous agreement on many subjects. It has been possible through this mechanism in good spirit to agree to differ but to resolve to work together.

INTERNATIONAL FEDERATION OF PREVENTIVE MEDICINE AND PUBLIC HEALTH

The Executive Board has also given thought during the year to the part which the American Public Health Association should play in a world-wide federation of public health associations which was organized in 1950 in Paris with the aim of working closely as a voluntary agency with the World Health Organization. It had been hoped that this problem could be resolved during 1952 with a meeting of the International Federation in Cleveland at the time of the 80th Annual Meeting of the APHA. However, financial obstacles have prevented this joint meeting and for the present the program and the meetings of the International Federation will have to be improvised as circumstances may permit until funds and an adequate staff are available. Great credit is due to Dr. Rene Sand of Belgium and to such leaders as Dr. J. H. Tuntler of the Netherlands for the efforts that they are making to build a useful international organization.

COMMITTEE ON PROFESSIONAL EDUCATION

The Committee on Professional Education, under the chairmanship of Leroy Burney, M.D., has had a productive year. It expects to bring to the Governing Council for approval at the Cleveland meetings a report on Educational Qualifications of Public Health Dentists substantially in the form as it was published in the February, 1952, issue of the *Journal*. This will bring to a total of 16 the number of formally approved reports for public health specialists which the committee has brought to the Governing Council. Their distribution among trainees as well as among health departments and employing agencies, merit systems, etc., continues to be large.

The Executive Board, upon recommendation of the Committee on Professional Education, has approved reaccreditation of the 11 schools of public health in North America accredited for the previous year. The list of approved schools and the specific degrees appears in the July, 1952, issue of the *Journal*.

The Committee on Professional Education has under advisement the future policy of continued visitation to the schools and departments which has now been maintained for seven years, most recently entirely at the expense of the APHA. It is possible that the matter of accrediting institutions will appear in a new light as a result of the National Commission on Accrediting which is now studying this problem.

The Accreditation of Field Training Areas for Public Health Physicians was completed during the year by the publication, both through channels of the American Medical Association and of the American Public Health Association, of a list of 39 areas located in 12 states. At the last report the number of medical residents in training indicated a steady increase in the demand for these facilities but as yet an inadequate response. Additional areas are being reviewed for future approval through the channels established in 1950 between the American Medical Association, the American Board of Preventive Medicine, and the American Public Health Association.

The report called "Desirable Characteristics of Approved Residencies in

Public Health" is being revised by a representative committee under the chairmanship of V. A. Van Volkenburgh, M.D.

Active consideration during the year has been given to the extension of the accrediting program for field training to other specialties beside that of medical officers. The Committee on Professional Education sponsored a meeting of health educators under the auspices of the Health Education Section, APHA, at which the next steps for field training of health educators were fully explored. It is anticipated that other conferences of this kind will be held during the coming year. The committee is grateful for the continued support of the W. K. Kellogg Foundation of a program now in its third year aimed to stimulate and evaluate field training facilities.

PROFESSIONAL EXAMINATION SERVICE

Members of the Council are familiar with the fact that the Professional Examination Service (formerly known as the Merit System Service) has provided professional examinations to official agencies and to universities for the selection and testing of public health personnel. During the current eleventh year of the operation of this project it has been possible to advance the extent and quality of this unique service through which the public health professions have been able to apply the newer precision methods of examination.

It was reported last year that licensing boards are beginning to follow the lead of the universities and of the American Board of Preventive Medicine in using these proved methods in testing personnel. Presently the Professional Examination Service is providing examinations for the American College of Hospital Administrators and is about to undertake similar service for the National Board of Veterinary Medical Examiners. Meantime, active negotiations are under way for the use of these methods with three national groups of dentists, with Civil Service examiners in some of the smaller professional specialties, and with a number of other professional membership organizations.

Two-thirds of the states are actively using the product of the Professional Examination Service and each month more than 1,500 examination booklets are sent out to public and private agencies for these purposes. The U. S. Public Health Service has continued its cooperative program with the APHA in the selection and promotion of its own professional personnel.

Special appreciation is noted for the help of the National Foundation for Infantile Paralysis which since 1946 has sustained field consultation on professional personnel matters under the auspices of the Association. Although the appropriation from the foundation terminated as of July 1, 1952, there is good evidence of an added momentum in this application of modern personnel methods to public health. The desirability of continued support from funds of this kind is manifest.

The Committee on Professional Education has declared its opinion that the Professional Examination Service should explore the area of licensing examinations in the various states with the thought that the public health can be advanced through better testing methods. In line with this policy an examination for the licensing of physicians by state boards of medical examiners has been prepared and tried out among three states and 350 candidates. The Executive Board has had some reluctance to approve this venture unless outside financing becomes available.

SALARIES OF PUBLIC HEALTH WORKERS

The Executive Board in 1949 approved a recommendation coming through the Committee on Professional Education of a salary scale for medical officers of health. It was apparent that

the scale paid the health officer was influential in fixing the scale of compensation paid to other employees in official departments and experience has shown that this recommended salary schedule had considerable influence in acquainting employing officers with current rates of pay for these highly trained persons, together with some explanation of why there is such a shortage of persons available at lower levels of compensation.

The Committee on Professional Education concluded that by mid-1952 the situation had sufficiently changed so that this statement should be revised, and its Salary Subcommittee proposed a new schedule aimed to maintain the status of the medical officer of health against the rises in the cost of living. This revised schedule which lifts the recommended levels by about 20 per cent was adopted by the Committee on Professional Education and by the Executive Board and was printed in the September, 1952, issue of the *Journal* (p. 1126). Members of the Governing Council, together with other members of the Association, can extend the range of usefulness of this report by using it as a frame of reference in many situations, including nonofficial positions.

COMMITTEE ON ADMINISTRATIVE PRACTICE

The Governing Council will be gratified at the leadership which Professor Ira V. Hiscock has brought to the Committee on Administrative Practice since he assumed the chairmanship following Dr. Halverson's election as President-Elect.

Believing that this Standing Committee ought to be strengthened through systematic meetings of its members, the Executive Board made available funds from the increased dues income sufficient for a spring meeting of the committee and for the meetings of several of its subcommittees. This has resulted in an excellent statement of objectives and functions of the committee, reflecting the importance of provision for its effective functioning.

Under the APHA By-laws the committee is authorized to collect information regarding current public health practices and to analyze the material obtained to derive standards of organization and achievement. In the opinion of the committee, this long-standing concept now should be spelled out to include such subjects as an expanded interest in accident control, promoting the fluoridation of public water supplies, practical problems of transportation of field personnel, specific problems related to maternal health, the best use of nonmedical administrators and other auxiliary personnel. The committee has set for itself new goals of liaison with the Committee on Professional Education in the administrative aspects of personnel and recruitment practices. The committee will continue a long-standing concern with records, reports and clerical procedures. Most importantly, the committee will undertake studies on newer aspects of public health, such as chronic disease and rehabilitation, and the development of principles and criteria for the prevention, diagnosis and rehabilitation of the chronic diseases.

During the year a staff assembled under the auspices of the Committee on Administrative Practice completed a report of the health services in New York City prepared at the request of the Mayor's Committee on Management Survey. The report is digested in the August, 1952, *Journal*, p. 1000. It is hoped that it may have far-reaching influence in setting the pattern of New York City practice for the future. A supplemental report on medical care services in the Department of Welfare in New York City was also made for the Mayor's Committee.

STUDIES IN MEDICAL CARE

The Subcommittee on Medical Care

has continued to direct its interest toward improvement of medical services for the public through special studies and some proposed policy statements on medical care in relation to public health departments. A Joint Committee with the American Public Welfare Association has formulated a statement on "Tax-Supported Medical Care for the Needy," designed to assist health and welfare agencies in the development of more effective medical care programs. This report is published in the October issue of the *Journal*, p. 1310. A supplemental grant for these purposes has been received by the APHA from the Rockefeller Foundation with which this cooperative program of the American Public Welfare Association can be expanded to provide consultation services for public health and welfare agencies aimed at improving these programs.

This subcommittee has continued to maintain an active interest in chronic illness as a problem of increasing nation-wide concern. The staff and members of the committee have actively participated in the work of the National Commission on Chronic Illness now in independent operation. The original sponsors included the APHA, the American Medical Association, the American Hospital Association, and the American Public Welfare Association. The aim of the committee is a major attack on chronic illness through programs of prevention, early detection, and prompt and comprehensive treatment.

The subcommittee staff has conducted a survey of the types of health education and preventive medical services conducted by several prepayment plans and consumer sponsored plans. A staff report has been published on *General Medical Care Programs in Local Health Departments*. A comprehensive bibliography on medical care for the needy has been distributed.

Looking to the future, the subcommittee is devoting attention and study to the improvement of health and medical services through the extension of hospital services to communities by way of regional programs.

It is gratifying to report that these studies of the subcommittee have received a new grant from the Rockefeller Foundation for a period of five years which will insure the basic staff, and headquarters have been set up in New Haven, Conn., through the courtesy of Yale University School of Medicine, which is providing office space.

Jonas N. Muller, M.D., M.P.H., of California, has been appointed staff director for the subcommittee, succeeding Milton Terris, M.D., who resigned after five years of productive service to become assistant dean of the University of Buffalo School of Medicine.

STUDY OF NUTRITION SERVICES IN HEALTH DEPARTMENTS

A Subcommittee on Nutrition Practices of the APHA Committee on Administrative Practice has been appointed to study nutrition services at national, state, and local levels. Under the chairmanship of Daniel Bergsma, M.D., health officer of New Jersey, a distinguished group of persons representing federal, state, and local administrators as well as health educators and nutritionists, is directing the study of a small working staff under Fredrick J. Stare, M.D., of the Harvard School of Public Health. Funds to carry out the project have been made available to the Association by the Milbank Memorial Fund, the Nutrition Foundation, and the Williams-Waterman Fund of the Research Corporation. It is anticipated that a manual of nutrition practice will be developed that will serve as a guide for public health administrators, nutritionists, other members of the team of public health workers and students in schools of public health and for field training courses.

LOCAL HEALTH UNITS

The Governing Council will remember that, in accordance with its recommendation, the Executive Board has given sustained support to a movement to cover the United States with full-time health units. During the current year the Board again supported a bipartisan approach to this subject in which it was hoped to enlist the unanimous support of professional societies. However, in spite of the manifest advantage for the defense program, it was not possible to persuade the Congress to pass a federal aid bill for this purpose and it will be necessary to bring it up before the Congress again if this is to be achieved. It is the intention of the Executive Board, however, in cooperation with the Committee on Administrative Practice and its Subcommittee on Local Health Units, and in cooperation as well with related agencies, to maintain consistent pressure for this goal until it is achieved. We have worked very closely with the Association of State and Territorial Health Officers, and conferences have been held with the American Medical Association representatives in the hope of resolving certain differences in point of view.

COMMITTEE ON RESEARCH AND STANDARDS

The Committee on Research and Standards has completed two full decades of operation under the leadership of men like Abel Wolman, Dr.Eng., L. J. Thompson, M.D., Kenneth Maxcy, M.D., Thomas Francis, Jr., M.D., and now William McD. Hammon, M.D.

These years have seen the growth of a systematic method for handling reports, such as those on *Standard Methods for the Examination of Water, Sewage and Industrial Wastes; Standard Methods for the Examination of Dairy Products*, and such useful volumes as *Diagnostic Procedures and Reagents* and volumes on shellfish, virus and rickettsial diseases, and a series of publications on the hygiene of housing. The committee has grown to a stature of a major committee. Especially effective among more than a score of subcommittee interests has been the work of the Coordinating Committee on Laboratory Methods which, since its organization, has been under the chairmanship of Friend Lee Mickle, Sc.D.

This Standing Committee has satisfaction in having brought to completion the cooperative project on the Tenth Edition of *Standard Methods for the Examination of Dairy Products* shortly to be before the Governing Council for approval. A digest of the proposed changes is published in the September *Journal*, pages 1131–1134. Of equal significance is the Tenth Edition of the volume on *Standard Methods for the Examination of Water, Sewage and Industrial Wastes*, prepared cooperatively with the American Water Works Association, and this year for the first time, with the Federation of Sewage and Industrial Wastes Associations. This manuscript is expected to receive final approval from the Committee on Research and Standards and to come in usual course before the Governing Council for adoption as an official standard of the Association. These two volumes now cover a period in their various editions of about half a century and represent a unique continuity of such documents in any professional society. They make possible a mechanism for unifying laboratory and health department practice among more than fifty state and territorial jurisdictions which, unless coordinated, might operate with serious conflict. Thanks to these volumes and similar volumes for diagnostic procedures and reagents and on rickettsial diseases, routines in the various states and territories are strikingly similar even in the absence of any national plan for compelling uniformity.

The Subcommittee on Laboratory Re-

search on Pertussis, under the chairmanship of Pearl L. Kendrick, Sc.D., has continued for another year its efforts to devise more satisfactory measures of the antigenicity of this vaccine. It is increasingly apparent that the methods arrived at after years of study are showing results. This work is cooperatively supported by a group of drug manufacturers.

The Subcommittee on the Hygiene of Housing has published this year the *Proposed Housing Ordinance* which already has received encouraging acceptance.

Circulation of the housing publications detailed in the report a year ago has continued to a gratifying extent. The Association continues grateful to the Milbank Memorial Fund for its sustained support of these studies.

The Committee on Research and Standards took responsibility a year ago for exploration of the problem of hospitalization of the communicable diseases. All the various organizations involved in the conference have approved the final report and have agreed that a manual for the care of communicable disease cases in hospitals under the auspices of the APHA should be developed.

The very widely read volume on *The Control of Communicable Diseases in Man* has been reissued at the request of the Army Medical Service Graduate School, Department of the Army, in an edition with notes on therapy and pertinent Army directives for each of the 80 diseases. The response to this expanded edition has been so gratifying that consideration is being given to the publication of this additional information in future editions of the APHA book, although at present the therapy sections are not a part of the official report as adopted by the Governing Council which, of course, would be clearly indicated in the text.

The next year gives promise of the publication of a much needed volume in a new area of activity for R & S. This will be a laboratory volume on the microbiological examination of foods.

The Committee on Research and Standards has new subcommittees getting under way on laboratory methods for the examination of air and on radiological health.

FLUORIDATION OF PUBLIC WATER SUPPLIES

The Association was among the agencies heard in support of fluoridation before the House of Representatives Select Committee To Investigate the Use of Chemicals in Food Products, which concluded its hearings in March. The use of fluorides was under a sharp attack. Many questions were raised in the minds of the public by the conflict between competent scientific opinion on the one hand and the individual opinions, largely of politicians, on the other.

The Association's testimony was centered around the objective experiences in the Newburgh-Kingston, N. Y., experiments reported by David B. Ast, D.D.S., M.P.H., whose testimony is published in the May issue of the *Journal*, p. 634.

ASSOCIATION COMMITTEE ON CHILD HEALTH

This has been a year of active progress by this committee of which Samuel M. Wishik, M.D., is chairman. We have been fortunate again to operate with a staff under grants from the Association for the Aid of Crippled Children and from the New York Fund for Children. Florence A. Browne, M.D., M.P.H., has continued to serve the subcommittee, and recently Elinor Fosdick Downs, M.D., M.P.H., has been added to the staff.

In addition to the manual under preparation on the Child Health Conference, the committee has actively under way,

through the cooperation of a large group of specially qualified persons, reports on health department programs relating to the handicapped. These will include the areas of cerebral palsy, cleft palate rehabilitation, conservation of hearing and vision, orthopedic handicaps, emotional maladjustments, together with general principles for community programs for handicapped children.

Policy Statement on Maternity and Infant Care for Military Dependents—Recognizing the current importance of problems relating to maternity and infant care for military dependents, the committee drafted a report on this subject which was reviewed with care and somewhat revised at the request of the Executive Board.

Believing that the problems were of sufficient urgency to deserve prompt publication, the Executive Board authorized the publication of this report as an official statement and it was carried in the April, 1952, issue of the *American Journal of Public Health*. The report represents a substantial examination of this whole field in a thoroughly objective fashion and it is evident that the report was influential in the deliberations of Congressional committees concerned with this problem, as well as in the counsels of other professional groups with a common concern.

Maternal and Child Health Programs During a Period of National Emergency—Reflecting a serious concern in the APHA Committee on Child Health, a study was undertaken of the special problems of maternal and child health programs during a period of national emergency. An excellent report on this subject by the committee was published in the May, 1952, issue of the *Journal*, supplementing the document just referred to.

NOMINATING ROUTINE FOR OFFICERS

This is the third year of operation of the new plan established in 1949 by the Governing Council for the selection of a Nominating Committee for Officers and Executive Board members to provide advance notice of the slate selected and to permit deliberate consideration for additional names when indicated. This committee of five, consisting of the president, the chairman of the Executive Board, ex officio, and three members of the Council elected at the last meeting (Ernest G. Eggert, Joseph G. Molner, M.D., and James E. Perkins, M.D., chairman) have reported a nomination for each of the positions (president-elect, three vice-presidents, treasurer, and two members of the Executive Board). Again their report is being sent to members of the Governing Council well in advance of the meeting. Other nominations may be made, as provided in the By-laws, by petition, or they may be made from the floor at the first meeting of the Council on October 20, the voting to take place at the second meeting, October 22.

As this report is written there is pending the selection of ten elective councilors through a mail ballot in which all Fellows and members have the opportunity to participate. This is the second year of voting by all the membership. The results will be reported to the Council at Cleveland by the Tellers, of whom Carl L. Erhardt is chairman.

The vacancy in the Executive Board membership caused by the untimely death of Joseph W. Mountin, M.D., for the term expiring in 1952 has now been filled through a mail ballot of the Council, as provided in the By-laws. Ernest L. Stebbins, M.D., of Baltimore is the replacement.

NOMINATIONS FOR SECTION OFFICERS

The Nominating Committees of several of the Sections have completed their 1952 slates of nominees for various Section offices and for membership on Association committees in advance of the Annual Meeting. The Executive Board

has requested that the reports of Section Nominating Committees be made widely known to the membership through publication in the *Journal* and in the final Annual Meeting program. The proposals for eleven of the Sections, all of which under the By-laws are subject to additions through petition, are carried with the preliminary program in the September issue of the *Journal*. By this means the Board hopes that there will be much wider participation in the selection of Section officers and representatives and that the privilege of adding by petition may be used wherever indicated.

FINANCIAL STATUS

The current financial status of the Association indicates that again for the first nine months of the current year both the estimates of expense and income have been kept approximately within the balanced budget of $498,117 adopted by the Executive Board. The income and expense of the Annual Meeting is always a large and somewhat unpredictable item which will have to be taken into consideration by the Executive Board during the later months of this calendar year. Within the total budget, $290,000 is anticipated as the income to be received by the Association through its self-sustaining core activities. An amount of almost $208,000 is anticipated from special project income supported by funds from outside sources. The total represents a budget of very similar size to that of the preceding year.

The Executive Board will continue to be responsive to the wishes of the Governing Council in applying available funds to those activities which stand highest on the priority list.

ANNIVERSARIES

April 18, 1952, marked the 80th Anniversary of the first meeting called by the founders of the American Public Health Association. We can have real pride in belonging to this largest and oldest of professional societies for public health workers.

This year three of the Sections mark anniversaries, including 35 years since the establishment of the Food and Nutrition Section in 1917, 30 years since the establishment of the Public Health Education Section in 1922, and 10 years since the establishment of the School Health Section in 1942. Meaningful changes have taken place in public health during these intervals and in every instance the respective Section has had a part and sometimes a very large part in advancing these specialized programs. We mark this year also 25 years of collaboration at the time of the Annual Meeting with the American School Health Association.

IN CONCLUSION

Again this year it is my pleasure to congratulate all who have given service to this cooperative enterprise which is the American Public Health Association—the members of the Governing Council, of the Executive Board, the officers of Sectional Committees, Standing Committees, and others who have helped in some capacity to make this 80th year important in the Association annals. Especially I wish to congratulate the 13 Section secretaries who have labored so effectively on the Annual Meeting program and on many other Association affairs.

Very sincere thanks are due to those individuals and agencies who have provided funds for Association purposes. Without this specially focused help a good proportion of our work could not have been done this year or any year. The list of Sustaining Members of the Association is published each month in the *Journal* and now represents a total of 51 names, which again has helped beyond any other single category of the income to sustain the Association, mak-

ing possible many of the objective achievements of this professional society.

To our advertisers and to our commercial exhibitors, many of whom are long-time and faithful friends, we express our appreciation for continued interest and support.

As chairman of the Executive Board I specially wish to thank the Rockefeller Foundation, the National Foundation for Infantile Paralysis, the Milbank Memorial Fund, the W. K. Kellogg Foundation, the Albert and Mary Lasker Foundation, the New York Fund for Children, the New York Foundation, and the Association for the Aid of Crippled Children for contributions to specific enterprises, making possible much of the program of the Association and its service through innumerable channels to the public, together with other activities to which reference is elsewhere made.

On behalf of the Executive Board and the Governing Council, I should like to take advantage of this opportunity to express the gratitude we all feel so keenly to the entire Association staff. We simply could not function without their untiring and devoted work. All of us see the effective way in which Dr. Atwater, Dr. Kandle, Mrs. Walsh, and Mr. Elder function. The other loyal members of our staff are less often seen, but we are equally indebted to them.

So, in brief summary, stands the 80th year of the American Public Health Association. Of course, there should be added to this record the issues of the *American Journal of Public Health*, the 1951–1952 *Year Book* and other periodical publications of the Association. There can be no doubt that the most vital contributions of all, however, lie in an intangible realm, where such elements as the increasing professionalization of public health and the wider public support for its services are important. Again, it is a good record to mark this year of the Association.

HUGH R. LEAVELL, M.D., *Chairman*

Administrative Practice*

THERE are occasions when it pays to pause and take stock in order to get a fresh start. This has been such a year for the Committee on Administrative Practice. I wish to express gratitude to the Executive Board for its authorization of Association funds for a spring meeting of the committee and for meetings of several subcommittees which have made possible a review of activities and objectives of the committee. The members expressed themselves as follows:

The concept of the Committee on Administrative Practice is supported as expressed in the Association By-laws, as follows: "This Committee shall engage in the collection of information regarding current public health practices and analyze the material obtained to derive standards of organization and achievement." The committee believes, however, that this concept should be broadened to include also such subjects as the following:

1. An expanded interest in accident control.
2. Fluoridation of public water supplies.
3. Problems of transportation of field personnel.
4. Specific problems in maternal health.
5. Best use of nonmedical administrators and other auxiliary personnel.
6. Administrative aspects of personnel and recruitment practices and liaison with the Committee on Professional Education in these fields.
7. Records, reports, and clerical procedures.
8. Studies on chronic disease and rehabilitation and the development of criteria and principles for the prevention, diagnosis, treatment and rehabilitation of chronic diseases and their sequelae.

The method of study groups used so effectively throughout the history of the Committee on Administrative Practice should be continued by establishment of new groups and discontinuance of others as areas of public health practice requiring increased attention are identified.

Your attention is invited to the attached addendum entitled "Milestones of the Committee on Administrative Practice." This list of events indicates substantial accomplishments. We intend that this record will be maintained or surpassed.

EVALUATION PROJECT

After careful consideration the subcommittee believes that the work on the evaluation process as built around the *Evaluation Schedule* must go on. It has been handicapped and has lost its momentum in the last year or two because of the loss of financial support. A new project is being developed and funds are being sought.

The need for adequate measuring rods to be used by administrators in this field is increasing. The methods suitable for the 1950's must contain essential elements of the useful procedures of the earlier decades of evaluation studies and, in addition, those which have been gained through wide experience and new developments.

It seems manifest to the committee that the next step in the evolving process of evaluation requires that a new schedule based on present concepts be developed. This will result in materially advancing the local practice of public health.

The project would consist of three parts, as follows:

1. The identification of the basic assumptions on which desirable public health practices are founded. A short, annotated bibliography of studies which have tested the assumptions would be supplied when available.

2. Items would be constructed designed to permit local health officers and communities to

* Report of the Chairman of the Committee to the Governing Council, October 20, 1952.

ascertain to what extent and how well the accepted public health practices were being applied in the community. The items to be included would be objective in nature and capable of measurement so as to permit local health officers to measure progress in their own communities and compare their work with that of others.

3. The materials evolved would be made available widely through the APHA together with as much consultation and assistance as possible.

A draft of the statement "State Health Department—Services and Responsibilities" has been submitted to the *American Journal of Public Health* for publication (*A.J.P.H.* 42:1450 (Nov.), 1952) in order to secure comment. This is still a draft and your criticisms are sought. It is difficult to develop a statement which will have wide acceptance in this complicated field. Our subcommittee and the Committee on Administrative Practice have labored over this for at least three years.

FIELD STUDIES

Field studies completed during the past year include:

New York City Department of Health
New York City Medical Care Services in the Department of Welfare
Georgia State Health Department
Nashville-Davidson County, Tenn.
Tuberculosis Control in Virginia

The New York City studies were conducted under the direction of a project group of four, including the field director and three professors from Harvard, Johns Hopkins, and Yale Schools of Public Health. The Tennessee and Georgia studies were made in cooperation with the Public Health Service. Both have resulted in action and better public health services.

MEDICAL CARE

The October, 1952, issue of the *American Journal of Public Health* carries the statement on "Tax-Supported Medical Care for the Needy." Prepared by a joint committee with the American Public Welfare Association, this statement is designed to assist health and welfare agencies in the development of more effective medical care programs.

The subcommittee's program is now supported on a continuing basis by a grant from the Rockefeller Foundation. A supplemental grant has enabled the American Public Welfare Association to provide consultation services for welfare agencies and to develop a cooperative program for medical care of the indigent.

The subcommittee has continued its active interest in the problem of chronic illness, medical care teaching, and studies of prepayment plans. The Yale University School of Medicine is providing office space for the subcommittee in New Haven. Jonas N. Muller, M.D., M.P.H., of California, accepted appointment as staff director on July 1, succeeding Dr. Milton Terris. Dr. Muller will serve also on the teaching staff of the Yale University Department of Public Health.

CHRONIC DISEASE AND REHABILITATION

Recognizing chronic illness and disability as major public health problems, the Committee on Administrative Practice is organizing a new Subcommittee on Chronic Disease and Rehabilitation. Lester Breslow, M.D., chief of the Bureau of Chronic Diseases, California State Department of Public Health, has been appointed chairman.

The Committee on Administrative Practice recognizes that its Subcommittee on Medical Care has long been interested in certain aspects of chronic illness. This interest was most recently manifested by the organization of a special study group on chronic disease control. These two groups, the new subcommittee and the study group, will be concerned with studies of chronic disease control and rehabilitation programs and with the development of criteria and principles for public health and medical

care programs for chronic diseases and their sequelae.

The Subcommittee on Chronic Disease and Rehabilitation is charged with primary responsibility for study of the role of official health agencies, local, state, and federal, in the control of chronic illness and disability. Such study and appraisal should lead to definition of effective methods of integrating these new areas of interest with existing programs. It will be concerned with subject matter of interest to many disciplines represented in the American Public Health Association.

LOCAL HEALTH UNITS

Arriving at the goal of complete coverage, which was the basic purpose of the committee's study, has not yet taken place. In fact, additions to those with basic local public health service have barely kept up with increases in population. There are still 40,000,000 persons in the United States without locally organized full-time local health services. Since 1942, local health units have increased by a little more than 10 per cent and the counties served by more than one-quarter.

To guide the committee in its discussions, the directors of local health services in the 48 state health departments were asked to express themselves on these matters. Replies were received from 25. In these states, reporting a population of 48,000,000 served, average per capita expenditures in local health departments ranged from 70 cents to $1.84. In nine of the 25, the per capita was below $1.00.

Among the 25 there was an obvious reluctance to publicize a minimum per capita figure, partly because a minimum tends to be a maximum in the minds of appropriating bodies and partly because of the feeling that the emphasis should be on providing community services rather than on what should be spent. There is general agreement that services should be started whenever possible even though what is considered a basic minimum of funds is not available.

Of the 25, two were opposed to stating any minimum, nine suggested $1.50; 10, $2.00; three, $2.50, and one, a range of from $1.75 to $2.25. As to a statement about minimum expenditures that the committee might helpfully make, perhaps the best expression of what was in several minds suggested that a statement recommend a minimum per capita appropriation, point out that actual per capita costs can be determined on the basis of the individual community's health needs and its general policies and traditions, and that since community needs do not always exist in proportion to community resources, local funds may need to be supplemented by state and federal funds.

As to minimum population, there was general agreement that, except in sparsely settled areas with widely scattered populations, 50,000 should be recommended as a minimum. Two persons, one from a highly urbanized, densely populated state, another from a very sparsely settled western state, suggested that no minimum population be recommended; one suggested 33,000; 17, 50,000; three, 75,000; and one, 100,000. One suggested 50,000 as a maximum.

The National Health Council's National Advisory Committee on Local Health Units has continued as active as its limited personnel and finances permit. It has up to the present time distributed six issues of its information bulletin. It sponsored *Your Neighbor's Health Is Your Business* which is being widely used to arouse general citizen interest in community health services. Articles have been prepared by its chairman for *County Officer*, the magazine of the Association of County Officials.

A sixth regional conference was held in mid-November in Roanoke, Va., to discuss local health problems of Mary-

land, North Carolina, Virginia, and West Virginia. The Council on Health and Medical Care of Virginia was host.

A South-East Conference centering around the Georgia area has reached the discussion stage.

On the basis of counting all areas that cooperate by employing the same health officer as joint departments, 1,209 departments, serving 1,560 counties partly or wholly and a population of 108,600,000, were reported as of July 1, 1952. These figures are practically the same as those of last year. Although a number of new departments have been organized, some states, notably West Virginia, have lost ground. Kansas, Louisiana, Mississippi, Missouri, Oregon, and Texas have each lost from one to three counties covered. In addition, for the first time in a number of years, accurate data were available from Pennsylvania showing that previous estimates had overstated the situation. In other words, we are at almost "dead center."

NUTRITION PRACTICES

A manual of nutrition practices which would serve as a guide for public health administrators, nutritionists, for teaching purposes, and field training is nearing completion. This project is supported by grants from the Milbank Memorial Fund, the Nutrition Foundation, and the Williams-Waterman Fund of the Research Corporation. A subcommittee has been appointed with Daniel Bergsma, M.D., commissioner of health of New Jersey, as chairman, to work with the staff under Dr. Fredrick J. Stare of the Harvard School of Public Health. They have been at work for several months and will complete the project this year.

ACCIDENT PREVENTION

This active subcommittee has a new chairman, Frederick S. Kent, chief, Home Accident Prevention Unit, of the Public Health Service, who has agreed to carry on the good work of Dr. I. J. Brightman.

RECIPROCAL SANITARY MILK CONTROL

This subcommittee is of the opinion that the pattern has been set for the reciprocal acceptance between health jurisdictions of reports covering the sanitary control of milk supplies. Where the Public Health Service ordinance and rating system is not in effect and is not acceptable locally it should be possible to establish some mutual agreement between neighboring states for evaluating and accepting each others work in sanitary milk control.

PUBLIC HEALTH NURSING

Our Subcommittee on Public Health Nursing was discharged pending the reorganization of the national nursing agencies. We look forward to even closer association with the Department of Public Health of the National League for Nursing. The members of the staff of the National League for Nursing and nurse members of the Committee on Administrative Practice and its subcommittees have worked throughout the year on the Committee on Administrative Practice affairs.

PUBLICATIONS

"Veterinarian in Public Health" (1951–1952 *Year Book*, p. 73).

"BCG Vaccination" (1951–1952 *Year Book*, p. 72).

Cars for Public Health Nurses*—a statement and a series of papers from *Public Health Nursing*, February through July, 1952.

The Committee on Administrative Practice continues to be active in a wide variety of fields. It is clear that the need for careful studies in the administrative aspects of public health con-

* Publications of the Committee on Nursing Administration of the National Organization for Public Health Nursing which served also as the Subcommittee on Public Health Nursing of the Committee on Administrative Practice. An editorial on this subject appears in the *American Journal of Public Health*, 42:1308–1309 (Oct.), 1952.

tinues unabated. The work of the committee is severely handicapped by lack of funds. The strength of the APHA, however, lies in the enthusiasm and diligence of its members serving on important committees and they have demonstrated that they can be counted on for sustained effort.

Deep appreciation is expressed for the devoted and able service rendered by Dr. Roscoe Kandle, Edith Boyd, and Katherine Richardson and for the cooperation of Dr. Reginald Atwater and the Executive Board.

IRA V. HISCOCK, SC.D.
Department of Public Health,
Yale University,
310 Cedar St.,
New Haven, Conn., *Chairman*

MILESTONES OF THE COMMITTEE ON ADMINISTRATIVE PRACTICE

1920—Committee on Municipal Health Departments

C.-E. A. Winslow, Dr.P.H., *Chairman*
Louis I. Dublin, Ph.D., *Secretary*
Charles V. Chapin, M.D.
Donald B. Armstrong, M.D.
Haven Emerson, M.D.
Allen W. Freeman, M.D.
Wade H. Frost, M.D.
Lewis R. Thompson, M.D.

Survey of health practices of 83 cities with populations over 100,000. (Committee began with this specific project, supported financially by the Metropolitan Life Insurance Company.)

1925—Name changed to the Committee on Administrative Practice, "in order to indicate its potential wider scope."

Preparation of first *Appraisal Form for City Health Work* completed under grant from Milbank Fund.

Health Officers *Newsletter* begun.

1926—Subcommittees organized, e.g.

Record Forms
Appraisal Form for Rural Health Work
Appraisal Form for State Health Work
Appraisal Form for City Health Work
Organized Care of the Sick
Model Health Ordinances
Standard Health Department Reports
Analysis of Public Health Procedure

Committee reorganized and enlarged to its present size and composition. "This change essentially involved the recognition of the committee as the 'technical service division of the Association'."

1927—Published *Community Health Organization*, edited by Ira V. Hiscock.

Appraisal Form for Rural Health Work.

1929—Health Conservation Contest (supported by 36 insurance companies during its 14 years of activity). *Evaluation Schedule* produced in its first form.

"After nearly 10 years of collecting data, formulating standards and devising methods of appraisal . . . the time seemed ripe for using these techniques in an organized effort to raise the general level of health practice throughout the country."

1930—Subcommittee on Evaluation of Administrative Practices formed. (Supported by the Commonwealth Fund.)

1933—First comprehensive survey of rural health service issued under editorship of Dr. A. W. Freeman.

1934—Health Conservation Contest extended to county health departments. (Supported by the W. K. Kellogg Foundation.)

Subcommittees during this period:

Record Forms (published *Manual on Record Forms*)
Organized Care of the Sick
Manual of Public Health Administration
Annual City Health Department Reports
Public Health Nursing
Relationship of Social Workers to Public Health
Industrial Health Appraisal

1935—*Recording of Local Health Work* by Walker and Randolph published by the Commonwealth Fund.

1937—First of 12-year series of grants from the Commonwealth Fund for state studies and evaluation.

1938—*Appraisal Form for Local Health Work* replaced previous separate city and rural forms.

1940—*Desirable Minimum Functions and Organization Principles for Health Activities* published.

1942—Subcommittee on Local Health Units formed.

1943—*Evaluation Schedule* replaced *Appraisal Form* and contest and honor roll activities abandoned.

First of five editions of *Health Practice Indices* (last in 1950).

1944—Subcommittee on State and Local Health Administration replaced Subcommittees on State Health Administration and Manual of Practice and Appraisal of Local Health Work.

1945—*Local Health Units for the Nation* published.

1947—Most recent revision of the *Evaluation Schedule*.

1948—*Sanitation Evaluation Schedule* developed.

1950—*What's the Score* published.

1951—*Local Health Department Services and Responsibilities* published.

Between 1924 and 1952 a total of 181 field surveys was made by the committee's field staff, of which 38 were state studies. (The staff also participated in a number of community studies sponsored by other groups and also arranged or

stimulated many studies by other surveyors.) It would be difficult indeed to measure adequately the influence on public health practice of the field consultations of men like Drs. Walker, Buck, and Palmer. There is evidence, however, of their influence in current organization of state health departments in many reports and in patterns of administration.

Grants totaling about $850,000 have been received during the period of the Committee on Administrative Practice's history to support its work. The largest of these were: $320,000 from the Commonwealth Fund; $220,000 from the W. K. Kellogg Foundation, $80,000 from the Public Health Service, and $40,000 from the Milbank Memorial Fund. An additional, significant amount was secured through field income from studies.

Quotes from "Fifteen Years of the Committee on Administrative Practice" by C.-E. A. Winslow (*A.J.P.H.* December, 1935):

> Its activities group themselves in logical order under five main heads: (1) collection of data as to actual administrative practice, (2) formulation of a typical or normal program of adequate community health service based on those data, (3) the preparation of an appraisal form by which actual health services in a given community may be objectively measured, (4) the making available of the knowledge and experience of the committee to health officers in such a way as to promote sound local programs and, finally, (5) the securing of public backing for such programs, by using the standards and the comparative ratings at our disposal to stimulate emulation as between various local areas.
>
> It required some courage in 1920 to attempt such a task (set up a norm or guide to be used by any community to provide really adequate health protection) and I well remember the trepidation with which we approached it.

Eligibility*

THE Committee on Eligibility approved membership applications for 1,169 in 1952.

Since the beginning of this meeting, the Eligibility Committee has met twice to consider for Fellowship the 234 applicants whose names were published in the September issue of the *American Journal of Public Health*. Of these, five were not approved by the various section councils, including the Executive Board which votes on applications for Unaffiliated Fellowship, and the Committee on Eligibility. The latter recommends unanimously to the Governing Council that the remaining 230 applicants whose names have been placed before you be elected to Fellowship in the American Public Health Association.

The committee also recommends that the names of the 11 Fellows and three members appearing at the end of the list of Fellowship applicants be added to the list of Life Members of the Association.

Following the more liberal view adopted in 1951 regarding the bestowal of Honorary Fellowships upon outstanding and distinguished personages abroad, whose impact upon public health is recognized the world over, the Committee on Eligibility is pleased to recommend that the following individuals be elected Honorary Fellows in the American Public Health Association:

Dr. James Mackintosh, professor of public health, London School of Hygiene and Tropical Medicine

Sir Andrew Davidson, chief medical officer, Department of Health, Scotland

Sir John Charles, chief medical officer, Ministry of Health for Great Britain

Dr. W. G. Wickremesinghe, director of medical and sanitary services, Ceylon

Dr. J. Greenwood Wilson, medical officer of health and school medical officer, Cardiff, Wales

Dr. C. Fraser Brockington, professor of social medicine, University of Manchester, Manchester, England

Dr. N. H. Swellengrebel, director, Department of Tropical Medicine, Royal Institute for the Indies, Netherlands

Dr. K. C. K. E. Raja, member secretary, Advisory Committee, All-India Medical Institute, New Delhi, India

Professor Bradford Hill, professor of biostatistics, London School of Hygiene and Tropical Medicine

JUSTIN M. ANDREWS, Sc.D.
Communicable Disease Center,
U. S. Public Health Service,
Atlanta, Ga., *Chairman*

* Report of the Chairman of the Committee to the Governing Council, October 22, 1952.

Professional Education*

THE year 1952 marks the twentieth anniversary of the establishment of the Committee on Professional Examination. If anniversaries are to serve any purpose it is to examine the initial and added objectives in relation to total accomplishments and future problems. The continuing purpose of the Committee on Professional Education has been "carrying out research and the development of standards for professional education and training in public health—with a view to maintaining professional qualifications of high standard." The committee's basic philosophy has been that public health is only as successful as the people in it. It has been the conviction of the committee that the remedy lies in improving the quality of personnel through better selection and training.

Has the committee merely extended general efforts in this direction or has it succeeded in devising and applying objective methods of measurement and appraisal toward the final objective of improved public health performance? The chairman of the committee hopes to show that the committee, its consultants, its staff and various subcommittees have made important contributions in improving the selection and training of public health workers through accurate methods adapted to each specific project. To mention the most important ones: The committee has been engaged in the evaluation of public health training both in academic institutions and in the field; it has promoted the use of scientific methods for the selection of public health workers; it has established levels of educational and experience qualifications which are basic for desirable performance but can also be met from a practical viewpoint; it has analyzed the annual figures on enrollment and degrees in selected professional schools and has detected important trends; it has promoted the periodic analysis of prevailing salaries and has attempted to establish an objective basis for salary recommendations; and it has cooperated in the formation of boards for the certification of public health specialists in various professional groups.

The history of these projects, the reason why the committee decided to explore and undertake them, and the way each of the programs was developed makes fascinating reading. It might be interesting to give the high lights on a few of these in greater detail.

ACCREDITATION OF SCHOOLS OF PUBLIC HEALTH

If we could choose but one word to characterize the program of accreditation of schools of public health, it would be "flexibility." Those groups who at the present are strongly objecting to accreditation of academic institutions by any outside agencies may well take notice of the manner in which the project of accreditation of schools has been handled in its first six years. It is doubtful that even those men whose vision stimulated the undertaking of this program quite foresaw its far-reaching constructive influence.

The success of this program to a large measure is due to the stature of the consultant on accreditation the committee wisely chose at the outset and who has faithfully served in this capacity ever since—Professor C.-E. A. Winslow. His wisdom, knowledge, kindness, humility, open-mindedness, and democratic

* Report of the Chairman of the Committee to the Governing Council, October 20, 1952.

spirit have been apparent in this project throughout. He has just completed a detailed historical, statistical summary of the experience of the first six years which, it is expected, the Association will make available in print.* This most interesting document will be useful in many ways, among others to the World Health Organization whose staff has considered the program with keen interest. It is likely that profound effect will be exerted on developments in countries where this area of education has not been actively pursued. In the report referred to above, Professor Winslow states: "Perhaps the most promising thing about the development of our schools of public health is their freedom from any form of crystallized standardization. The strait jacket of a fixed and uniform curriculum has not been imposed and we hope will never be imposed on our discipline. Our schools, therefore, provide 11 experimental laboratories in which new pedagogic approaches are constantly being devised." That the accreditation program itself has been remarkably successful in fostering increasingly high standards for public health training in the United States has been emphasized many times by the deans and faculties of the schools. How has this been accomplished without any attempt at standardization or regimentation?

By the 1940's there were 10 or more well established schools of public health in operation and many other institutions were giving less formal instruction in this field and offering a wide variety of degrees. In the spring of 1945, the Association of Schools of Public Health in which the leading schools were represented was perturbed about the fact that inferior schools were coming into existence and passed a resolution urging the American Public Health Association to "create a properly constituted accrediting body to carry forward progressively a list of universities qualified with regard to program personnel and facilities to offer adequate courses leading to the degrees of Master of Public Health, Doctor of Public Health and the Diploma of Public Health." The Committee on Postwar Training appointed by the Surgeon General of the U. S. Public Health Service made a similar request.

When it considered these requests, the committee's thinking ran along the lines of a maximal amount of academic freedom and a minimal amount of streamlining. The salient points brought out in one of the early discussions included the following:

There should be no set of standard regulations adopted and no enunciation of content of formal programs.

Criteria should be based on general principles rather than on standards of content of courses.

Required courses should be set at a minimum, leaving a broad field of electives.

Make no requirements rigid; keep complete flexibility with large areas free for experimentation.

The "core" faculty should be large enough to constitute a real policy and curricula making body.

Supervised field work to be strongly emphasized, only short of requirement.

This was a broad and flexible framework within which full cooperation by the schools could be obtained and constructive influences were able to operate.

In April of 1945 the Committee on Professional Education voted to undertake the task of accreditation and this policy was promptly approved by the Executive Board. Professor Winslow was appointed as consultant to carry out the task and funds were provided by the Commonwealth Fund for initiating the project. A set of criteria containing minimum essentials to be met by accredited institutions was prepared. They related to the standing of the institu-

* *The Accreditation of North American Schools of Public Health.* New York: APHA, 1953.

tion, the autonomy of the school, the size and structure of the teaching faculty, the income of the school, housing, library and field training facilities, the academic and experience qualifications of candidates for degrees, the desirable basic fields of instruction and electives. Courses and course content were not included in the criteria. The criteria were amended in certain minor respects in 1947; but in essence they have proved satisfactory. The actual work of accreditation began in the academic year 1946–1947. Ten schools applied for recognition in the beginning. Each school was visited by the consultant and one other person, in most instances a health officer from the general area served by the school but not officially connected with it, and a somewhat detailed schedule of information was obtained. In subsequent years a written schedule was filled out by each school and each school was periodically revisited by the consultant, for a period of three years, first annually, then biennially, and later on a three-year basis. Full statistical summaries of each school visited and a summary report on all schools were sent to the members of the committee and to all the deans each year and accreditation was recommended annually by the committee and voted upon by the Executive Board.

Not only did the consultant visit the schools which had applied for accreditation but he also visited and conferred with faculties of schools who were interested in establishing courses in public health and were looking for guidance. In both situations the consultant's knowledge and wisdom proved highly helpful to the schools. The reports on his field visits to individual schools and the annual summary reports proved most valuable. To call them "statistical reports" is an understatement, for each of them contains interesting general observations and constructive ideas. Let me read to you a few sentences from the Summary Report on the Academic Year 1946–1947 under the heading "How the Schools Might Educate Each Other":

> Nothing has been more striking in this survey than the variety of emphasis and the diversity of teaching procedures in different schools. This is a most desirable situation. Nothing would be less wholesome in this field than a deadly uniformity. Yet the surveyor has been impressed with the fact that special features which have been developed in particular universities might be utilized (or modified) with great advantage in others. Almost every school has something which it could teach to other schools. It might be highly profitable to develop an informal system of faculty interchange under which two schools would interchange a representative of each faculty with the other school for a three months' period. . . .

In this, as in any other developing project, problems arose and were squarely faced, discussed and tackled by the committee. Usually they were brought directly to the committee by those members who were connected with the schools, or the questions were raised with the consultant at the occasion of his visits to the schools. They included the problem of basic preparation of candidates; the accreditation of schools outside the United States and Canada; the accreditation of specialized degrees; the financing of the project; the listing of approved areas the schools might utilize for field training. Other problems will arise and should if this is to remain a dynamic rather than to become a static program.

ACCREDITATION OF FIELD TRAINING AREAS

The basic objective of accreditation of field training areas, as indeed of any accreditation in this field, is the improvement of public health performance. The committee's interest in the quality of field training dates back to 1944 when a Subcommittee on Field Training of Public Health Personnel was estab-

lished. The subcommittee completed a report in 1947 which was approved by the Governing Council. The immediate need for accreditation arose out of the requirement for accredited training as a prerequisite for certification by the American Board of Preventive Medicine, Inc. But certification by the specialty board is merely a device for improving public health standards through encouraging better training and more recruits.

In this early beginning of the accreditation program it has been impossible to evaluate training. Here as elsewhere, "the proof of the pudding is in the eating." The quality of training can be evaluated only in terms of the future performance of those who have been trained. The Committee on Professional Education was fortunate to be able to retain Dr. Haven Emerson as consultant and his vision and profound knowledge have given a good start to a very difficult enterprise. What the consultant has tried to determine is whether in a proposed area the content of training meets the desirable standards and whether the methods and the personnel are qualified to carry out the training content.

A subcommittee, under the able leadership of Dr. Van Volkenburgh, has prepared a "Guide for the Residency Training of Public Health Physicians," and has completed a revision of the experimental criteria drafted for the accreditation of field training areas. As experience with this more definitive statement of desirable training standards is developed, and as those who have completed residency training begin to make their mark on public health practice, it will be possible to assess the contribution of the Committee on Professional Education to improvement in the quality of performance through objective methods of evaluating the training and selection of public health personnel.

Again it is too early to appraise constructive influence in raising standards of training. The first year has been devoted to trying out in practice the criteria and qualifications of accredited health departments without attempting to apply any objective values to the difference in methods and personnel qualifications to be found among the 12 states with accredited training programs.

It is obvious that the same qualifications as required for medical health officer training can be made neither compulsory nor recommended for the training of nurses, health educators, sanitarians, and others without overloading the teaching possibilities of health departments accredited for health officer residencies. Other criteria will have to be developed for the approval of health departments as training agencies for other types of workers, as already worked out at present for field training of public health nurses.

The recent conference on field training of health educators arrived at the conclusion that experimentation and variety were more important at this stage than accreditation. It is anticipated that other conferences of this kind will be held during the coming year. The committee is grateful for the continued support of the W. K. Kellogg Foundation.

The residency training is intended for those who have completed all or at least half of their training in a school of public health. On the other hand, field training as a part of academic training is under an organized faculty staff and depends for its effectiveness on close cooperation between teachers of public health administration in schools of public health and closely adjacent health jurisdictions that can be attended without too much interruption of the student's attendance at the school. It is essentially observation of the practical examples of academic teaching, whereas the residency training is experience un-

der supervision in the actual responsibilities of a health officer.

The first list of accredited training areas, published by the AMA in September, 1951, after clearance through the APHA and specialty board channels, included 39 areas in 12 states.

The areas recommended by the consultant to the American Board of Preventive Medicine for accreditation by the Council on Medical Education and Hospitals in June, 1952, included these areas plus an additional one in Michigan. In New York where four additional areas were visited, it was recommended that the state program be accredited, with the understanding that no local area be used for training that did not meet the criteria of the specialty board, and further that any areas used for training be visited by the consultant.

Since the June recommendations, two additional states—Kansas and Texas—have applied for accreditation, Kansas of three areas and Texas of one. North Carolina has applied for one additional area. Each of these five areas has been visited and recommendations with regard to them will be included in the next series of recommendations.

A recent inquiry from the states with accredited areas for residency training reveals that 16 persons have completed training in eight states and 23 are currently in training. Three states with a total capacity for training seven persons have had no trainees. Of the 43 accredited areas, only 26 have been used.

PROFESSIONAL EXAMINATION SERVICE

For 11 years the work of the Professional Examination Service has been measurement. Through testing processes, the PES has over and over again produced a single number to stand as a meaningful index of the achievement of each of thousands of people. On this eleventh occasion of taking its own measure, the staff would feel that its sense of the fitting had been propitiated if it could report to the Governing Council a single number that would serve as a valid measure of the status of the service. Unfortunately, the measuring instrument precise enough to yield such a number is not available. It will be necessary, therefore, to resort to the more conventional methods of describing the events of the past year.

Until 1948, almost all of the income of the Professional Examination Service was derived from grants. In that year, a long-range plan was developed with the objective of achieving financial independence for the service. The basic element in this plan was to provide merit system agencies, for an annual fee, a complete, written examination service in the field of professional public health. In the year preceding the Annual Service Plan, 12 per cent of the operating expenses were met by income from examinations. During the present calendar year—four years later—the income from examinations is expected to meet 100 per cent of the costs of the program. During the year preceding the plan, less than 500 copies of examinations were distributed. In the first eight months of the present year, over 12,000 examination booklets were shipped to examining agencies.

These two sets of numbers represent achievement in two areas—the one, financial; the other, service. The first is significant only in relation to the degree that it makes possible enlargement and enrichment of the second. Although the pressures of obtaining financial stability have been great these past four years, they have not diverted the attention of the staff from the even more imperative need for increasing the usefulness of its program to the states and for exploring the values of other uses of its resources.

It was believed that the most significant contribution that could be made to the states was to increase the number

of available examinations. To this end, over 70 new professional examinations—more than one a week—have been prepared in the past year. This brings to almost 400 the total number of examinations on file for the use of states in selecting professional public health workers. At the present time, 30 states and nine local agencies are members of the Annual Service Plan.

An important problem associated with the use of the Professional Examination Service resources for other types of examination programs has been one of deciding which of the many possibilities would represent the most effective use of these resources. The officer selection and promotion examinations of the Public Health Service, the qualifying examination of the American Board of Preventive Medicine, examinations for students of public health, examinations to evaluate students in the Communicable Disease Center sanitarian training courses, obviously had high priority claims on the Professional Examination Service. All of these programs have been successfully under way for some years.

In the past year, the Professional Examination Service has undertaken several projects for professional organizations in fields other than public health. In each case, the PES has had examination materials available that were unobtainable elsewhere in the country. These agencies are: the American College of Hospital Administrators, with which the Professional Examination Service is developing a test that will be used to qualify candidates for membership in the college; the National Board of Veterinary Medical Examiners, which plans to develop a licensing test to be made available to state licensing boards; and the American Physical Therapy Association, which also is developing a licensing test for the use of state licensing boards.

The possibility of utilizing the procedure and materials of the Professional Examination Service for medical licensing has been under consideration for some time. The Executive Board in February authorized a limited exploration of this area. In the spring of this year, three states, Missouri, Wyoming, and Oregon, used the objective medical licensing test which the Professional Examination Service staff had developed. This represents the first time, so far as is known, that a completely objective test has been used to license physicians. It is also the first time that an identical test has been used by several states. The test met with approval of candidates and boards in all three states. Research now under way gives statistical proof of its validity. If support for this program is strengthened and broadened, its contribution to the practice of medicine will be a major one.

The objectives for the coming year, like the achievements of the past, are both financially and service oriented. Financially, the PES must continue to pay its own way and to build up a reserve. In the area of service, new and worth-while opportunities for development are anticipated from a variety of directions. Among these are a way of putting the Annual Service Plan within the reach of more local health units; research relating to the evaluation of the teaching of preventive medicine; wider use of the examination services in the field of professional licensing.

The report of Committee on Professional Education activities has as its theme this year the impressive role that the Association has played in the measurement and evaluation of significant aspects of public health. The Professional Examination Service is proud to have had an opportunity to contribute to this work of appraisal through its efforts to provide true assessment of individual public health workers. Certainly it can be said that the measurement of man can hardly fail to be an engrossing and

rewarding undertaking, if man himself is the measure of all things.

The three projects of accreditation of schools, accreditation of field training areas, and the Professional Examination Service each has developed its own methodology to the end purpose of better performance through better training and selection. Other projects undertaken or stimulated by the committee which were mentioned at the beginning of this report could also be discussed in greater detail from the same angle.

DEVELOPMENTS OF THE PAST YEAR

I believe the accomplishments of the committee during this past year lie within the same framework and some of them will be mentioned only briefly. A revised report on the Educational Qualifications of Public Health Dentists is ready for transmittal to the Governing Council; the report on Educational Qualifications of School Physicians is being revised and will soon be published in the *Journal* * in proposed form. A subcommittee has been appointed to prepare a report on Educational Qualifications of Physical Therapists in Public Health Agencies. This is a cooperative enterprise of the Committee on Professional Education and the American Physical Therapy Association.

The 1951–1952 data for the annual tabulation of degrees and certificates have been tabulated and will appear in the *American Journal of Public Health*.† The Public Health Service is cooperating in this project by furnishing data for engineers receiving graduate degrees in public health or sanitary engineering, as well as information on undergraduate degrees in sanitary engineering. Through agreement with nursing organizations, the American Public Health Association will no longer publish data on graduate degrees and certificates in public health nursing. The data will, however, include nurses enrolled and receiving graduate degrees in the schools of public health.

There is a steady demand for copies of the 16 reports on Educational Qualifications, the list of schools accredited by the Association, and the career pamphlets. For instance, 225 copies of the career pamphlet on *Public Health Statisticians* were requested by the Statistics Section of the APHA for use in a recruitment drive for new statistical personnel. The plan is to distribute the pamphlet to various colleges through local and state health units and to have prospective college seniors visit those departments for a day or so. Before implementing the program on a national scale, the Section Committee is experimenting with its possibilities in two areas, one in Tennessee and one in New York.

The Vocational Counseling and Placement Service continues to be an active and effective part of the Association's service. The ratio of openings to candidates registered is almost three to one. Friendly letters and other communications indicate that the service is effective in placing candidates, although the numbers are not large. The staff has the impression that the number of successful placements has increased during the past months. The service is active in recruitment, since it receives inquiries regularly from persons with an interest but without training in public health.

The report of the Subcommittee on Salary Study on "Recommended Salary Minimums for Public Health Physicians" was approved by the Executive Board and published in the *American Journal of Public Health* (Sept., 1952, pp. 1126–1130). The 1952 report on "Salaries in Local Health Departments" was published by the Public Health Service in cooperation with the American Public Health Association and the Association of State and Territorial Health Officers, and the 1952 report

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* *A.J.P.H.* 43, 1:75–82 (Jan.), 1953.
† *A.J.P.H.* 43, 2:216–219 (Feb.), 1953.

on "Salaries of State Public Health Workers" is in preparation.

RECRUITMENT

If the tenor of this report was "methods to produce better public health workers," its conclusion might be headed "more public health workers," followed both by exclamation and question marks. The chairmen of this committee, both the present and the previous chairmen, have devoted great parts of their past reports to the Governing Council to the problem of recruitment, the need, possible approaches and active attempts to alleviate the grave shortage. At the meeting of the Committee on Professional Education one year ago one of the members remarked: "We don't know how to recruit." A number of states, he said, have given public health fellowships for medical students. There is gradually being developed a good sales program for public health but there is no way of measuring it. In recognition of the need for knowledge which would be basic for intelligent recruitment, the committee's sponsorship has been extended to a proposed study in the use of psychological tests for public health workers carried out at a school of public health. It is hoped that a tool may be devised which will be useful to counselors and persons engaged in recruitment.

The Association's project of a large-scale recruitment program launched two years ago failed because an insufficient number of contracts was signed. A large part of the April meeting of the Committee on Professional Education was given over to the recruitment problem. It was brought out at that meeting that recent estimates supplied by the Public Health Service on personnel needed to meet even minimum requirements in full-time health units indicate that the recruitment situation, instead of being improved, is definitely worse; that the demands not only for new areas are increasing but also the demands for services in other countries. The discussion emphasized the need for analysis of the public health job, particularly that of the local health officer, in terms that would inspire imaginative young persons to enter the field. It was suggested that to the student the program should be presented as mental hygiene, hygiene of aging, detection, care and rehabilitation of chronic disease, occupational hygiene, and leadership and guidance in the provision of medical care facilities.

In the continued absence of any adequate resources for a national program, the staff in conference with the committee has suggested the possibility of conducting in one state a pilot type of project aiming to explore suitable methods and to test the assumptions of earlier proposals. It is hoped that the relatively modest funds required to do this job in a limited area may become available.

Once the basic methodology of recruitment is as well established as the methodology of some of the other projects discussed today we may be on the way to our goal of "improved public health performance" through the efforts of a more numerous group of well trained and carefully selected public health workers.

LEROY E. BURNEY, M.D., State Board of Health, Indianapolis, Ind., *Chairman*

Research and Standards*

FOR more than twenty years at each Annual Meeting you have listened to the story of the accomplishments of the Committee on Research and Standards. You have watched its growth and development and noted its contributions to the strength of the Association and the good of the public health. I assume that by now you are well acquainted with the responsibilities given this committee, so there is no need for lengthy introductions. If any of you want more specific information I refer you to the Constitution and By-laws. I also suggest that contrary to certain doubts cast by Shakespeare on the general topic, the name of this committee does describe its interests rather effectively.

I want to discuss the activities of R & S during the past year under two general headings, that of research and of standards. I do this advisedly, particularly to stress the growing interest of the committee in research. Since its formation, much of the energy of R & S has gone to the preparation and approval of standards. This is recognized as an essential activity and one that should be continued. However, the need for an ever-growing reservoir of basic information, available only through the results of research, plus the present opportunities for research support, are directing more and more of the committee's attention to research itself. Each year for the past several, more and more time has been given by R & S to a consideration of research that might be conducted by the committee or undertaken because of the stimulation and direct encouragement of the committee.

You know that there is a close relationship between "research" and "standards." The former usually results in the preparation of new or modified standards. On the other hand, the need for standards frequently outstrips the availability of reliable basic research data. Thus, circumstances may force the early preparation of standards which thereby become hypotheses to be proved or refuted by research. I hope you will understand if my discussions of research get close to comments on standards—or the other way about.

One of the oldest interests of R & S is that of housing. The Subcommittee on the Hygiene of Housing, C.-E. A. Winslow, Dr.P.H., chairman, is in its fifteenth year of activity. It is one of the few subcommittees of R & S that has a budget of its own. This year the anticipated expenditures are about $10,000. Most of the financial support from its start has come from the Milbank Memorial Fund.

The subcommittee typifies the kind of research, and a method for accomplishing it, open to R & S. Some of you may question the inclusion of the work of this committee under the caption "research." I think the classification is correct. Webster considers "research" to mean "critical and exhaustive investigation or experimentation having for its aim the discovery of new facts and their correct interpretation, the revision of accepted conclusions, the practical application of such new or revised conslusions." It is true that the subcommittee, for the most part, has not done a bench type of research. It has done as so many of our committees do. It has made it possible for many specialists to come together to investigate the significance of the experimentation many of them and others have done and to apply those results to the interpretation of housing

* Report of the Chairman to the Governing Council, October 20, 1952.

as it affects public health. Further, the subcommittee has gone on and has made very practical application of the newly accepted conclusions.

During the fifteen years that it has functioned, the subcommittee has published nine different volumes. The latest, published this year, is entitled *A Proposed Housing Ordinance*. It is receiving an excellent acceptance and has been commented on favorably in several technical journals.

Another volume, dealing with the problems of housing the aged, is nearing completion. Like all the other reports, this one promises to fill a real need in that it will be the first discussion of the subject by an unbiased group composed of experts drawn from the many fields involved in housing of the aged.

The Subcommittee on Laboratory Research on Pertussis is unquestionably performing research. This committee under the direction of Pearl L. Kendrick, Sc.D., and Grace Eldering, Sc.D., has been working on the development of more effective whooping cough vaccines. During the past year, operations were covered by a budget of approximately $5,000 furnished by several manufacturers of biological products, members of the American Drug Manufacturers Association.

Research during 1952 was directed along three general lines:

1. Studies on the stability of vaccines
2. Relationship of certain production methods to potency of vaccine produced
3. Cross-protection tests

Stability of vaccines has been explored to determine the effect of storage in temperatures at 5–10° C., room temperature of about 21° C., incubation temperature at 35–37° C., and at cold storage temperatures. These are continuing studies which were started in 1944. Other studies, started at the same time, are determining the effect on the keeping qualities of vaccine of different killing agents used in the preparation of the vaccine. The agents used are: merthiolate, phenol, formalin, and heat at 56° C.

The effect on potency of vaccine produced under differing conditions has also been investigated. The variable production characteristics include composition of culture media, age at time of harvesting, and a liquid medium as contrasted with a solid medium.

Cross-protection tests carried out so far indicate that the addition of parapertussis organisms to the pertussis vaccine would not add to protection against *H. pertussis* organisms. The same studies show that there is a closer antigenic relationship between *H. pertussis* and *Br. bronchiseptica* than between the former and the parapertussis organism.

The program for 1953 depends largely upon continued financial support. The studies currently under way will be continued, provided the funds are available.

No other subcommittee of R & S has funds for the immediate conduct of research. Many of the committees, though, are basing their activities upon the research done by committee members as individuals and others. Four more committees to be mentioned operate under the Coordinating Committee on Laboratory Methods of which Friend Lee Mickle, Sc.D., is chairman.

The Subcommittee on Laboratory Examination of Shellfish is continuing its preparation of a laboratory volume that would include chapters discussing the life cycle of shellfish, their public health significance in the transmission of disease, as well as laboratory technics. Cornelius B. Kelly, Jr., chairman of the committee, reports good progress but a probable delay in completion of the text due to desire of the committee to consider thoroughly factors of shellfish culture and control which are peculiar to the West Coast.

In past reports I have told of the

work done by the Subcommittee on Reference Methods for Syphilis Serology. Last year I reported that the reference method had been developed. This year I am glad to report that John F. Mahoney, M.D., and his committee have completed arrangements for the establishment of two centers for the production and distribution of the necessary antigens. One is the New York City Health Department Laboratory; the other the Venereal Disease Research Laboratory of the U. S. Public Health Service. Both production and distribution will be done in full cooperation with the committee.

The committee is also developing intimate working relationships with the Venereal Disease Section of WHO.

Two other Subcommittees, Antimicrobial Agents (Disinfectants), and Approval of Culture Media, have not got beyond the organizational stage but the future should note valuable contributions of each. C. A. Lawrence, Ph.D., chairman of the subcommittee dealing with antimicrobial agents will hold an organizational meeting here in Cleveland. It is hoped that his committee will work toward more realistic methods than are now available for measuring the effectiveness of disinfectants.

Luther A. Black, Ph.D., chairman of the committee striving to develop practicable means for measuring the characteristics of culture media, reports discouraging progress so far. The aim of the committee is to produce a synthetic medium composed of chemically specific ingredients that could be used as a "standard of comparison" medium for milk plate examinations. Availability of such a medium would make it possible for any laboratory to compare the cultural characteristics of media routinely used with those of other laboratories through comparative studies using the standard reference medium. A very practical value of such a medium would be in the possibility of testing the ability of any new media, that might be put on the market, to meet the requirements of *Standard Methods for the Examination of Dairy Products*.

A similar medium could be used in the laboratory examinations of other foods.

Development of the synthetic medium will be a definite basic research task. Funds will be required. Applications for support have been acted upon adversely in the belief that the work did not represent basic research. Efforts are now being directed to obtain assistance from some university.

Other activities of R & S might be classified as the establishment of standards, although I remind you that such standards must be based upon research. Two activities that will be of particular significance to you in the very near future are those that deal with our two *Standard Methods* volumes. Both responsible subcommittees also function under CCLM.

The first volume, *Standard Methods for the Examination of Dairy Products*, has been revised. The revision, or Tenth Edition, prepared by A. H. Robertson, Ph.D., and his committee, has already received favorable action by a specially appointed review committee of CCLM and by CCLM itself. I anticipate that R & S, during its meeting this evening, will consider the revision and recommend to you its publication as an official APHA report. Proposed changes to be incorporated in the Tenth Edition were published in the September *Journal*, reprints of which were sent to you a month ago.

F. Wellington Gilcreas is chairman of the subcommittee working on the Tenth Edition of *Standard Methods for the Examination of Water, Sewage and Industrial Wastes*. The most recent editions have been published jointly by the APHA and the American Water Works Association with the voluntary participation of the Federation of Sewage and

Industrial Wastes Associations. The Tenth Edition is being prepared with all three organizations serving as official joint publishers. Once again the APHA is responsible for bacteriological and microscopical methods.

One of the interesting studies undertaken by this committee is one to determine the limitations, and values, of the membrane filter technic. A cooperative study is being conducted in nine state health department laboratories. Results will not be available for the Tenth Edition.

Unanticipated difficulties have delayed the completion of the manuscript for the Tenth Edition. The committee hopes that it will be able to present to you in the next few months its recommendations for the publication of the volume as an Association publication.

I am happy to tell you that the demand for *The Control of Communicable Diseases in Man*, prepared by the Subcommittee on Communicable Disease Control, Haven Emerson, M.D., chairman, continues at a gratifying rate. An interesting innovation in the content of the volume was tried this year at the request of the Surgeon General of the Army. A special printing of the volume, including for each disease a short discussion on therapy and references to pertinent Army directives, was prepared for the Medical Department of the Army. The reaction to the addition of therapy has been so favorable that at our meeting tonight we shall consider again the wisdom of including this addition in subsequent revisions of the report.

Several committees have been authorized but are still too new to have any concrete program to report. Eventually, standards of public health practice should be available for the areas of interest of the committees. The Subcommittee on Laboratory Methods for the Examination of Air, F. Wellington Gilcreas, chairman, and the Subcommittee on Biological Products, Harold W. Lyall, Ph.D., chairman, both serve under CCLM. I think the titles of the committees indicate quite well their scope of interest.

Another new committee is the Subcommittee on Radiological Health, functioning directly under R & S. Captain Van C. Tipton (MC), U. S. Navy, is the chairman. The relationship of radiological hazards and civil defense will be only a secondary interest of this committee. Its principal concern will be the development of sound public health practices to be observed in the everyday contact with nuclear energy phenomena. This committee is preparing for the use of radiological materials in common services and activities.

An accounting of the activities of R & S in the area of standardization would be incomplete if I did not inform you of a brand new laboratory volume that is nearing completion. The Subcommittee on Methods for the Microbiological Examination of Foods is the ninth subcommittee of CCLM about which I want to tell you. (There is a total of 12 laboratory methods committees serving under CCLM.) Harry E. Goresline, Ph.D., chairman, has been working with his committee in the preparation of this new volume. Much of the contents will consist of individual laboratory methods prepared by committees of the Food and Nutrition Section. These have all been revised as indicated and new methods have been added to give complete coverage. The volume will be published by the APHA but not as an official document in its initial edition.

Jean-Marc Desranleau, a member of the Subcommittee on Enteric Phage Typing of CCLM, has been conducting research on phages in connection with the work of the subcommittee. He reported his findings to the International Reference Center in London. He has transmitted to the International Center

for study specimens of various phages that he has isolated. The subcommittee believes that several of these new phages should be substituted for those currently in use. Some of the new phages are more specific than the corresponding older ones. Pearl L. Kendrick, Sc.D., is chairman of the subcommittee.

Activities of two other CCLM Subcommittees: Diagnostic Procedures for Virus and Rickettsial Diseases, Thomas Francis, Jr., M.D., chairman; and Diagnostic Procedures and Reagents will be discussed in detail in subsequent reports.

The Subcommittee on Morbidity Registration, and the Subcommittee on Sanitation of Food Utensils, both operating directly under R & S, will be covered in detail in other reports. Paul M. Densen, Sc.D., is chairman of the former, and Walter D. Tiedeman is chairman of the latter subcommittee.

This statement, however, does not complete the full story of the work of CCLM. A full account must include a few words about Dr. Friend Lee Mickle, who for the past five years, the first years of the committee, has guided the affairs of the committee so successfully. It has been a task involving much work and time, one that has demanded a great deal of tact and diplomacy and one that has required imagination. Lee has done an excellent job. He continued as chairman this last year at considerable sacrifice to himself only because we could not accept his resignation due to the fact that we were unable to find a suitable successor.

Some activities of R & S fall outside the scope of any established subcommittee. One of these is the investigation of the relationship that may exist between poliomyelitis, particularly paralysis, and injections of antigens. An *ad hoc* committee, Gaylord W. Anderson, M.D., chairman, has been working with Donald T. Fraser, M.B., D.P.H., referee, on the subject. An initial statement, approved by R & S, was published last year in the *American Journal of Public Health*. This statement was revised in the light of newer knowledge and experience. The revised statement was published in the June, 1952, issue of the *Journal*, page 750.

Another special problem had to do with adoption of the new back pressure-arm lift method of artificial respiration. The endorsement of this method by R & S was published in the May, 1952, issue of the *Journal*, p. 619.

Alfred L. Burgdorf, M.D., has been serving as a special referee of the committee on the question of caring for communicable diseases in general hospitals. Last year I told you of the conference held in New York City to which representatives from four national organizations came for the purpose of discussing this problem. One of the recommendations included in the conference report was that a manual outlining proper methods for handling communicable diseases in general hospitals be prepared by a committee of the APHA. The report, including the mentioned recommendation, has been approved by all of the organizations represented at the conference. Dr. Burgdorf is now organizing the committee.

The growing international influence of the APHA is indicated graphically through the translations of our volumes into other languages. I have already reported translations of the current edition of *Standard Methods for the Examination of Water and Sewage* into German and *The Control of Communicable Diseases* into Portuguese. During the year permission was granted to the Institute of Sanitary Engineering, Milan, Italy, to translate the water volume into Italian. Permission was also given to the Central Institute of Hygiene in Ankara to translate *Diagnostic Procedures and Reagents* into Turkish. We are now in correspondence

concerning the translation of *Standard Methods for the Examination of Dairy Products* into Spanish.

Further international overtones are noted in the *Report of the Environmental Hygiene Committee,* Government of India Ministry of Health, dated October, 1949. The standards prepared by our Subcommittee on the Hygiene of Housing are referred to either by direct quotes or by liberal paraphrasing.

I have delved into a little research concerning the nature of R & S and its strengths. I realize, as I know you must also, that the strength of such a committee as ours and of the Association as a whole, depends upon the generous contributions of many interested and well qualified people. You will understand why this Standing Committee does such a good job when I tell you that, by actual count, the 251 committee spots—members of committees and subcommittees, consultants and referees—are filled by 196 different individuals. It is this group of almost 200 unselfish members of the public health profession to which you and I are indebted for the outstanding performance I have just recounted. I am proud to have been able to tell you about them.

WILLIAM MCD. HAMMON, M.D.,
University of Pittsburgh Graduate School of Public Health,
Pittsburgh, Pa., *Chairman*

REPORTS OF COMMITTEES

The By-laws of the American Public Health Association provide that no standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council. Except where specifically noted to the contrary, the following reports are in the nature of progress reports from committees, most of which have had Section approval, but which have not been presented for Governing Council action, and therefore are not to be interpreted as standards approved by the American Public Health Association.

A Survey of Coliform Organisms in Ice Cream*

Committee on Research and Standards

THE presence of coliform organisms in frozen desserts is generally believed to have the same sanitary significance as does their appearance in pasteurized milk.[1] These organisms serve as indicators of poor sanitary practice. Experience has shown, however, that the average number of coliforms found in ice cream is greater than that found in pasteurized milk. No coliform standards for ice cream are suggested in *Standard Methods*. The manual does give directions for performing the test on ice cream, however.

The original purpose of the present study was to compare the yield of coliform organisms by alternative methods of preparing the sample for analysis, namely, (A) by weighing it in the unmelted state, and then diluting it for plating as opposed to (B) allowing the ice cream to melt and then diluting it volumetrically, or measuring it volumetrically and plating it in the undiluted state. The first method is permitted in the Ninth Edition of *Standard Methods for the Examination of Dairy Products* (p. 205). *Standard Methods* does not approve of the volumetric measurement of melted ice cream for analysis except for screening tests (pp. 343–344). The data were also collected in an attempt to obtain answers to the following questions:

1. What is the practical optimum quantity of ice cream which yields a reliable finding on solid differential medium?
2. Do solid and liquid media yield the same numerical estimates of coliform content of ice cream?
3. Do the number of coliforms vary according to the flavor of the product, the season of the year, or the type of laboratory, i.e., industrial, public health, or educational?
4. What is the usual numerical range of coliforms found in ice cream?

METHODS

The pertinent directions given to all laboratories were contained in an instruction sheet and are as follows:

Two wide-mouthed vials (A and B) are filled with sample. A is kept frozen and B is iced or refrigerated (32° or 40° F.). Transport A and B in suitable containers under conditions met with in actual practice, such as from plant to laboratory. Plating is to be done as soon as practical after receipt of samples in the laboratory. In "Remarks" please state the transportation procedure and plating time used. In the laboratory test the samples according to *Standard Methods*, Ninth Edition, with modifications, as follows:

A. Temper at room temperature 10 minutes; weigh 10–11 gm. into a dry, sterile dilution bottle, using a spoon dipped in alcohol and flamed; make into 1–10 dilution by adding proper volume of water. Pipette into plates or tubes as is shown in the tabulation on the following page.

Petri dishes are to be poured with 15–20 ml. desoxycholate agar. *Standard Methods*, Ninth Edition is to be followed in all other respects. Where results in the plates or tubes are not distinct or clearly discerned enter tabulation as N.D. (not discernible). Count only dark red colonies measuring at least 0.5 mm. in diameter in the Petri dishes after 20–24 hours at 35° C. If pink colonies are encountered, make completed test before tabulating coliforms. Note these results at base of column. Run completed tests when presumptive reactions are at variance between solid and liquid

* This study was carried out by a Subcommittee on the Examination of Frozen Desserts of the Subcommittee on Standard Methods for the Examination of Dairy Products with the collaboration of laboratories in the United States and Canada.

Plate or Tube Procedure	*Plate No. or Tube Letter*	*Cell*
4 dishes, 1 ml. of diluted sample each	1, 2, 3, 4	A1
4 " 2½ " " " " "	5, 6, 7, 8	A2
4 " 5 " " " " "	9, 10, 11, 12	A3
Brilliant green bile lactose broth (2 per cent) fermentation tubes		
10 tubes, 1.0 ml. of diluted sample each	*Y*	A4

B. Proceed as in 7.11 b. (p. 205). Pipette into plates or tubes as follows:

Plate No. or Tube Letter	*Cell*	*Plate or Tube Procedure*	
1 dish, 0.1 ml. direct (not diluted)		1	B1
4 dishes, 2½ ml. of dilution sample each (11 ml. added to 99 ml. water)		5, 6, 7, 8	B2
2 dishes, 1.0 ml. direct (not diluted) each		9, 10	B3
Brilliant green bile lactose broth (2 per cent) fermentation tubes			
10 tubes, 0.1 ml. direct (not diluted) each		**X**	B4

media. Fermentation with gas in the tubes within 48 hours at 35° C. constitutes a positive result.

Printed data sheets were also furnished. The latter were filled out and returned to the committee usually monthly and occasionally bimonthly. It was suggested that a separate sheet be used for each product (ice cream, or mix, or ingredient) checking the proper square at the head of the sheet. All entries were to be in ink or typed. Actual counts of Petri dish results were to be entered. The tube results were to be recorded as either P (positive) or N (negative) or N.D. (not discernible).

The media used were arbitrarily limited to one solid medium and one liquid medium. Sodium desoxycholate lactose agar * (No. 114) in the dehydrated form was the solid medium used and brilliant green bile lactose broth (2 per cent), also in the dehydrated form, was the liquid medium used. This agar medium, rather than the other commonly used medium, violet red bile agar, was used only as a matter of convenience. Likewise, the brilliant green bile lactose broth was employed because it is the most commonly used liquid medium for this purpose.

International Business Machine equipment was used for punching data cards from data sheets and sorting and tabulating them. A glossary of terms used in the analysis of the data follows:

(a) Cell—each of the 8 subdivisions of technic described above.
(b) Cell Total—sum of coliform colonies on all the Petri plates in an individual cell.
(c) Punched Sample—sample which was transferred to an IBM card.
(d) Nonpunched Sample—sample not transferred to an IBM card for one of the following reasons:
1. All 6 cells (A_1, A_2, A_3, B_1, B_2, B_3) yielded no coliform colonies.

* The Subcommittee is greatly indebted to the Baltimore Biological Laboratories, Inc., Baltimore, Md., which furnished all the sodium desoxycholate agar and to the Difco Laboratories, Inc., Detroit, Mich., which supplied all the brilliant green bile lactose broth.

2. At least one cell of the sample had an average number of coliform colonies per Petri plate equal to or greater than 400.
3. At least one plate of a cell was marked T.N.C. (Too numerous to count).

(e) Short Sample—a sample in which cells A_2 and B_2 were omitted by the laboratory performing the test. After the study had proceeded for some time, certain laboratories were instructed to omit the A_2 versus B_2 comparisons.

(f) Summer Sample—a sample plated during the months of May through October.

(g) Winter Sample—a sample plated during the months of November through April.

(h) Product—one of the 6 categories of ice cream or ice cream mix used in the analysis. They are as follows: (1)—vanilla, (2)—chocolate, chocolate chip, chocolate frosty and fudge, (3)—fruit, fruit with flavor other than nut, (4)—nut, nut with flavor other than fruit, (5)—ice cream mix, (6)—all others—coffee, lemon, lime, orange, mixed fruit and nut, etc.

FINDINGS

A comparison was made first between cells A_2 and B_2. These 2 cells were chosen for comparison because all factors were identical except the method of preparing the sample. Included in each was the same number of plates (4) and the same quantities of ice cream per plate (0.25 ml., in one case by weight, and in the other by measure). It was first determined that the 4 plates of a cell did not differ significantly from each other (Appendix 1). Studies were then made to determine if the average difference in count between these 2 cells was significant (Appendixes 2a to 2d, *et seq.*). These were carried out by several statistical procedures on a varying number of samples ranging from a maximum of 1,511 to a minimum of 518, comprised of all flavors, and from all laboratories. Although the count on A_2 exceeded that on B_2 in more than half of the cases, a significant difference, nevertheless most of the comparisons of average differences were not significant. A possible exception was that the geometric mean of A_2 was 7 per cent greater than that of B_2. While this difference is of borderline significance from a practical viewpoint it is of questionable importance when critical low count results are considered.

Next, A_3 was compared with B_3 in a manner similar to the above. The total quantity of ice cream in each cell was the same (2 ml.) but cell A_3 had 4 plates and cell B_3 only 2. It was found, in contrast with the A_2 vs. B_2 comparison, that A_3 yielded greater counts than did B_3, as shown by the average arithmetic difference and by the number of times A_3 exceeded B_3. Thus, there was a mean difference of 4 coliforms per ml. for those samples of which at least one of the cells had a count of 10 or less and A_3 was greater than B_3 83 per cent of the time (Appendix 3).

The first 3 cells of the nonmelted ice cream (A_1, A_2, A_3) were then compared against each other (Appendix 4) in order to determine which of the 3 quantities of ice cream tested yielded the greatest number of colonies per unit volume. It was found that $A_3 > A_2 > A_1$, (i.e., that 5 ml. of the 1/10 dilution was better than 2½ ml. of the same dilution and that the latter was better than 1 ml.). The difference in both cases was statistically significant.

The data from the two cells using liquid medium (A_4 and B_4) were then compared (Appendix 5). It was determined that A_4 had a significantly greater proportion of positive tubes. A_4 exceeded B_4 in 58 per cent of the cases.

The plate method giving the highest average count (A_3) then was compared with the tube method giving the highest average MPN (A_4) (Appendix 6). The plate count method gave significantly higher counts than did the tube method. For example, when comparison was limited to those samples where at least one of the cells had a count of 10 or

TABLE 1

Summary of Findings on Methods of Analyzing Ice Cream for Coliform Organisms

Unmelted Ice Cream (A) (Weighed and Diluted 1/10)				Melted Ice Cream (B) (Measured)			
			RELATIVE PRODUCTIVITY			*Diluted 1/10*	*Undiluted*
Ml. per Plate	*No. of Plates*	*Total Gm.*	*Designation*	*Total Gm.*	*No. of Plates*	*Ml. per Plate*	*Ml. per Plate*
1 ml.	4	0.4	A_1	0.1	1		0.1
			∧				
2.5 ml.	4	1.0	$A_2 > B_2$	1.0	4	2.5	
			∧				
5 ml.	4	2.0	$A_3 > B_3$	2.0	2		1.0
Volume per Tube	No. of Tubes		∨		No. of Tubes		Volume per Tube
1 ml.	10	1.0	$A_4 > B_4$	1.0	10		0.1

less it was found that the mean plate count was 8 per ml.; whereas the mean MPN was 2.4 per ml., a highly significant difference.

The A_3 findings with all samples were compared to determine whether the factors of flavor of product, season of year (winter or summer), and classification of the testing laboratory had any influence on the results (Appendixes 7 and 8). It was ascertained that none of these factors influenced the count.*

Standard Methods, as was mentioned, does not suggest a standard for coliforms in ice cream. This is partly because there are no assembled data on coliform incidence upon which a standard might be based. The present study afforded the opportunity to analyze a group of data assembled from localities distributed over this country, from which an estimate of coliform incidence in ice cream might be derived. The A_3 data (2,012 samples) were arranged for this purpose in a cumulative series according to estimated coliform numbers per ml. from 0 to too numerous to count. It was noted that 44 per cent of the samples revealed the presence of no coliform organisms per ml. in the quantity tested (2 ml.), that a little less than ⅔ (63.5 per cent) had a count of 5 or less, that 70 per cent had a count of 10 or less, 78 per cent a count of 20 or less, and 90 per cent 200 or less.

These findings might be used as a basis for coliform standards. Thus, for example, if a system were adopted whereby it is required that 3 of 4 counts not exceed the standard, it might be set at a figure in the range of 10–20, preferably at 10.

SUMMARY AND DISCUSSION

Two methods of preparing ice cream for coliform analysis were compared, i.e., weighing it in the unmelted state and

* Relatively few samples of certain fruit flavored ice creams, particularly bananas and peaches, were analyzed in this study. It is known, however, that these fruits are a common cause of high coliform counts in ice cream. They, thus, represent a special problem. Some manufacturers, nevertheless, have apparently satisfactorily solved this problem.

then making a 1/10 dilution before plating (A_1, A_2, A_3), or inoculating into liquid medium (A_4), versus allowing it to melt and then making the same dilution by volumetric measurement before plating (B_2) or plating in the undiluted state (B_1, B_3) or inoculating in the same state into liquid medium (B_4). See Table 1 for a summary of these findings. It was found in the (A_2) versus (B_2) comparison that, although the unmelted samples were more frequently higher in count than the melted ones, the actual difference in count was of dubious significance. However, when (A_3) versus (B_3) was compared, the variation was quite significant, the average arithmetic difference of those samples, in which at least one of the cells did not exceed 10 per ml., being 3.6 colonies. Likewise, when the 2 methods of preparing ice cream for inoculation into liquid medium were compared, it was found that (A_4) yielded a higher average MPN.

When the 3 different quantities of ice cream used for each coliform determination on unmelted ice cream were compared for relative productivity it was found that the greatest volume (5 ml. of a 1/10 dilution in each of 4 plates for a total of 2 gm.) yielded a significantly higher estimate than did ½ that volume (1 gm.). Likewise, the latter quantity gave more colonies per unit volume than did the smallest amount tested (0.4 gm.).

Since the use of both solid and liquid media is permitted by *Standard Methods* for coliform analysis of dairy products, the comparison of 2 representative types of such media is of interest. It was found that the solid medium (sodium desoxycholate agar) was more productive than the liquid one (brilliant green bile lactose broth). Thus in the example cited, where the counts were in the lower range, the yield by plate count was more than 3 times that of the tube MPN estimate.

A poll was taken of the cooperating laboratories to determine the opinion held by the participants of the methods used. Most of the laboratories responded. There was an overwhelming preference for the solid as opposed to the liquid medium (20–2). When this fact is combined with the objective findings of greater productivity of the solid medium discussed above, it seems that the use of liquid medium should not be recommended. Likewise, the use of an unmelted sample was preferred to the use of a melted one by a vote of 12–10. Ten of 23 experienced some difficulty in weighing the frozen sample and a few in adding the proper amount of water to make the 1/10 dilution. There apparently was little objection to plating the 1/10 dilution made from the unmelted ice cream in 1 ml. or 2.5 ml. quantities or reading those plates after incubation. There was, however, some opposition, to the use of the 5 ml. quantity because of difficulty in pouring the plates (about 1 in 3) and reading them afterward (8 of 19).

Objections were raised, on the other hand, by about half of the laboratories to the direct pipetting of undiluted ice cream, particularly the 0.1 ml. quantity. There was similar disapproval caused by difficulty in mixing the undiluted ice cream with the agar. Furthermore, about half of the laboratories experienced difficulty in counting the plate inoculated with the 1 ml. quantity.

Integration of the analysis of the data and the poll of participating laboratories leads to certain conclusions concerning the unmelted vs. melted, diluted vs. undiluted, and size of sample. There is preference for the use of unmelted ice cream and the latter method apparently yields higher coliform findings than does melted ice cream. The use of melted and undiluted ice cream for plating seems to have found little support. This is partly caused by difficulty in pipetting and also in distributing the ice cream evenly in the plate. It should be

noted that this method has been used in the New York City Health Department Laboratory for several years. However, the use of a mechanical device (Boerner Rotator) was found necessary to secure uniform distribution of ice cream in the plate.

The finding that the largest quantity of unmelted ice cream used (5 ml. 1/10 dilution) gave the greatest yield and hence the most reliable result conflicts with the stated opinion that 5 ml. is difficult to handle in a single Petri plate. It would seem impractical to decrease the volume per plate and increase the number of plates used. A possible solution would be to decrease the dilution from 1/10 to 1/5. If 2 ml. of ice cream is the preferred quantity for analysis, then many laboratories have not been using an adequate quantity in routine analysis.

The finding that neither the flavor of the product nor the season of the year had a significant effect on the number of coliforms was surprising. It is known that certain products, such as whole fruit ice cream sometimes tend to have higher coliform counts than other flavored ice cream because of the addition of some fresh fruit to the product after pasteurization. Yet, a very detailed breakdown of the data failed to reveal a significant difference among all the flavors tested. Similarly, in a study carried out several years ago in New York City, a difference in summer and winter counts on ice cream and on pasteurized milk was noted.

The present data cover a diverse array of samples studied during all the seasons for a period of several years at laboratories throughout the United States. Because they thus offer some idea as to the coliform content of ice cream, it is suggested that they might serve as a reasonable guide to coliform standards.

If the over-all findings on the incidence of coliforms in ice cream can be accepted as typical they support the general belief that coliform counts in ice cream are higher than those in pasteurized milk and suggest, perhaps, that efforts are in order to determine if it is possible to improve this record.

CONCLUSIONS

1. Unmelted rather than melted ice cream is preferred for the coliform analysis of that product.
2. The use of undiluted ice cream was found to be unsatisfactory.
3. The validity of coliform analysis is related to the volume analyzed. The largest quantity tested, 2 gm., gave the highest count.
4. The one solid medium used (sodium desoxycholate agar) gave significantly higher coliform estimates than did the one liquid medium used (brilliant green bile lactose broth).
5. Neither season of year, flavor of product, nor type of laboratory, under the conditions of the study, seemed to influence the number of coliforms in ice cream.
6. It is suggested on the basis of the findings that a coliform standard might be established for ice cream in the region of 10 per ml. with a provision that 3 of every 4 samples comply.

REFERENCE

1. *Standard Methods for the Examination of Dairy Products.* Ninth Edition. New York: American Public Health Association, 1948.

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APPENDIX

Purpose of Test	*Data Used*	*Analysis*	*Results*
1. Do the plate counts of a cell differ significantly from each other?	25 random samples none of which had a cell total of 0.	A X^2 value was computed from the 4 plates of each A_2 cell. The 25 X^2 values were fitted by the appropriate theoretical frequency distribution. Cells A_1, A_2, B_2, B_1, were treated similarly.	The observed distribution of X^2 values was satisfactorily fitted by the theoretical distribution.
2. Comparison of the A_2 plate count with the B_2 plate count.			
2a. Do A_2 and B_2 differ significantly in their distribution with respect to number of cells too numerous to count?	All samples (both punched and non-punched).	Hand tally of samples showed the following: A_2 | B_2; Cell totals countable 1,511 | 1,511; T.N.C. 50 | 52	There is no significant difference between A_2 and B_2 with regard to this distribution.
2b. Is the average difference between A_2 and B_2 greater than 0?	Number of samples used varied from 595 to 1,511 depending on the disposition of cells with counts in excess of 30 or 10, and of cells with both counts 0.	7 distributions of $d = A_2 - B_2$ were obtained.	The average difference in favor of A_2 varied from 0.15 to 0.71 and in no case was statistically significant.
2c. Is the average difference between log A_2 and log B_2 greater than 0?	All punched samples where both A_2 and B_2 had counts of 2 or more—518 samples.	$d = \log A_2 - \log B_2$ was obtained.	$\bar{d} = .0293$, $\sigma\bar{d} = 0.0134$ Significance is borderline. Antilog $\bar{d} = 1.07$.
2d. Does A_2 exceed B_2 in more than ½ the number of samples?	All samples except where both A_2 and $B_2 > 10$ and where $A_2 = B_2$. (523 samples).	The proportion of times A_2 exceeds B_2 was tested for significance of difference from ½.	A_2 exceeded B_2 in 58 per cent of the cells, which differs significantly from ½.
3. Do A_2 and B_2 give equal coliform counts?	All nonshort samples except where both cells exceeded 10—1,188 samples.	Test of average arithmetic difference and proportion of times A_2 exceeds B_2.	A_2 gave a significantly higher count than did B_2 by inspection. Average difference = 3.6.

APPENDIX

Purpose of Test	*Data Used*	*Analysis*	*Results*
4. Are the colony yields of A_1, A_2, and A_3, equivalent?	All punched nonshort samples except where the counts being compared were both 0. There were 536 samples in the A_1 and A_2 comparison and 608 samples in the A_2 and A_3 comparison.	Weighted averages obtained by multiplying A_1 by 5 and A_2 by 2. A series of differences $5A_1-2A_2$ and $2A_2-A_3$ were obtained.	The differences by mere inspection were found to be overwhelmingly in favor of A_2 over A_1, and A_3 over A_2.
5. Does the productivity of A_4 exceed that of B_4?	All punched samples (1,171).	A frequency distribution of the differences of number of positive tubes, i.e., A_4-B_4. The average number of positive tubes was also converted to MPN.	Average number of positive tubes: $A_4 = 3.81$, $B_4 = 3.55$. The difference is statistically significant.
6. Comparison of A_3 plate count with A_4 MPN estimate.			
6a. Can negative samples and those marked T.N.C. be omitted from the comparison?	Nonpunched samples (842).	Hand tally of A_4 values.	The "all-zero" samples generally gave all tubes negative, and the T.N.C. samples all tubes positive. Hence, punched samples only need be employed.
6b. Does the proportion of positive tubes from all samples with a specific A_3 value yield an MPN estimate equivalent to that value?	i All punched samples (1,171). ii All punched samples (889) except those where A_3 and A_4 exceeded 20 are omitted. iii All punched samples (769) where $A_3 \leq 20$.	A distribution of the differences between the A_3 and the MPN derived from the corresponding A_4 values.	The average difference was always in favor of A_3 and was significant.
7. Do the factors of type of laboratory or product form bases for classification?	All samples except those that were T.N.C. or where the cell average exceeded 400 — 1,926 samples.	A mean A_3 count was obtained for each of the 36 subgroups, 6 flavors x 3 laboratory types x 2 seasons. The summer samples were arranged in an array of 6 rows and 3 columns and an analysis of variance performed. The same procedure was followed for winter samples.	The average count did not vary significantly from laboratory to laboratory, or from product to product.
8. Does the factor of the season of year form a significant basis for classification?	Same as 7.	The mean summer count was compared with the mean winter count.	The average count did not vary significantly from summer to winter.

Progress in Evaluating APHA Exhibits*†

THE primary purpose of the Scientific Exhibits Committee is to stimulate interest in more and better public health exhibits, both for the American Public Health Association annual meetings and generally, and to help individual exhibitors to improve their exhibits. As one of its activities, the committee each year reviews the exhibits at the annual meeting and calls special attention to those which are judged outstanding.

During the past three years an objective evaluation schedule developed after the 1948 Boston APHA meeting has been used by the committee in selecting the exhibits to be granted special mention. During this period, the identification of outstanding exhibits has been made wholly on the basis of findings obtained through use of this evaluation schedule.

The purpose of the present paper is to describe the method of evaluation in use and to summarize some of the findings obtained during this three-year period. In presenting this report the committee hopes:

1. To call attention to certain major exhibit weaknesses that have been identified through the use of the schedule and in this way help to stimulate better exhibits.
2. To provide some guidance to those who are interested in pretesting or evaluating their own exhibits or who wish to evaluate exhibits at other public meetings.
3. To help answer questions that have been raised by many members and exhibitors as to the criteria and technics of evaluation employed by the committee.
4. To invite reactions to the evaluation schedule now in use and in this way encourage others to develop something better.

There are several specific limitations placed on evaluating exhibits at annual meetings. It is not possible in such a situation to measure any long-term effects, nor is it possible for lack of time, personnel, and facilities to conduct a complete study of audience reaction each year. The scoring of the exhibits for the awards must be done quickly so that the findings can be announced to the membership before they have completed their visits to the exhibits. This means, with respect to the APHA meetings, that the entire evaluation process must be carried out between Monday noon when the last exhibits are unveiled and Tuesday evening when the awards are announced.

Such an evaluation requires intensive effort on the part of a relatively small force of volunteers who are willing to sacrifice their opportunity to take part in other activities. The method they use must be one that can be learned quickly during a period of confusion when neither the time nor the situation is wholly favorable to the training of observers or interviewers.

Any method used for evaluating exhibits at an annual meeting must be feasible and practical in terms of the limiting conditions that exist. At the same time, it must be as objective as possible and thus subject to the least possible observer or scorer influence. For exhibitors not faced with the limitations cited above, some more elaborate and more valid method of evaluation may be practical.

The evaluation schedule described in this article is designed to satisfy these

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* Report of the Chairman of the Subcommittee on Evaluation. Scientific Exhibits Committee.

† Credit should be given to members of the Public Health Education Section and other members of the American Public Health Association who have contributed by participating in the evaluation of the exhibits at the annual meetings.

specific requirements. It is so constructed that any professional person following a brief training period can complete the schedule in about 10 minutes. In order to assure the maximum objectivity, both in the observing and in the scoring processes, items have been selected that can be objectively checked, reported, and scored. In addition, all of the factors included in this evaluation schedule have been identified in various objective studies as important to exhibit success.[1, 2, 4, 5, 7] However, experimental studies have not as yet been made to determine their relative importance. Lacking such scientific evidence, weightings assigned to these items in the scoring of the exhibits have been based on the combined judgment of members of the Scientific Exhibits Committee.

The completion of the evaluation schedule requires that ratings be made by unbiased observers. Most of the exhibits were evaluated independently by teams of three APHA members who volunteered their services.* Each of these volunteers accepted the responsibility for observing about 8 or 10 exhibits, but no evaluator was permitted to judge any exhibit in which he was in any way personally concerned. The completed schedules were scored and tabulated by clerical personnel working under the direct supervision of members of the committee. While some errors occurred because of the pressure of time and the use of inexperienced personnel, every effort has been made to keep the entire process as objective and accurate as possible.

THE EVALUATION SCHEDULE

In developing the evaluation schedule it was recognized that the only valid criterion of exhibit effectiveness is evidence that its specific goals have been achieved. However, there seems to be no way to obtain such evidence while satisfying the various limiting conditions that exist at annual APHA meetings.

There are, nevertheless, a number of intermediate steps or requirements that have to be satisfied in order for the exhibit to be effective. If these requirements are not satisfied, the exhibit has no chance of being effective. Data on whether or not these requirements are satisfied can be obtained in the immediate situation of an annual meeting and the evaluation schedule is designed to obtain data of this nature.[8, 9]

The schedule yields a score on a range from 0 to 100 points. Fifty points are credited for the satisfaction of various physical or structural aspects of exhibits, as described below. The other 50 points are credited for the satisfaction of certain dynamic requirements—i.e., whether the purpose of the exhibit is clearly transmitted to the observer and whether this purpose ties in with the interests of the observer. Since the distinction between these categories is not clear-cut, the distribution of points is based on the group judgment of the committee.

Items Concerned with Physical or Structural Aspects of Exhibit Success (50 points)

The first part of the schedule is concerned with certain physical or structural requirements pertaining to exhibit success. People must be physically exposed to the message or information contained in the exhibit if they are to be influenced by it. They cannot be influenced, for example, unless they can clearly see the message from the point of observation. Words, concepts, and illustrations need to be understood. If they are not fully understood, people may remain uninformed, or may become misinformed or confused. The message must be short enough to be imparted during the brief period people usually

* During the first two years, some of the evaluators failed to turn in all their schedules so that a few exhibits were not adequately covered.

spend looking at exhibits. Effectiveness may also be facilitated if a qualified attendant is present to answer pertinent questions or discuss the specific problems raised or if these questions are answered through some literature readily available. The use of audiovisual aids or technics to activate the exhibit may also under some conditions facilitate learning.[7]

Five items are included in this part of the evaluation schedule. In the scoring, 10 points have been credited for the satisfaction of each of these.

The first item is concerned with the problem, "Can you read the exhibit from the point of observation?" Four questions are asked in this area:

1. Is the print large enough to permit the main theme to be read from the aisle?
2. Is your view of the exhibit theme free from obstruction by such things as coats, vases, flowers, etc.?
3. Does the lettering stand out in sufficient contrast to the background?
4. Is the source of light protected from the view of the observer?

Failure to satisfy any one of these 4 requirements means that the purpose of the exhibit cannot be imparted to the observer. Ten points are given in the scoring if all of these questions are checked "yes" by the observer. No points are given if *any one* of these 4 questions is checked "no."

Studies have shown that many people shy away from statistics or from charts or graphs that they identify as being statistical in nature. The second item is therefore concerned with the use of graphics. Ten points are given if no charts, graphs, or diagrams are used, or if less than 20 per cent of the exhibit is devoted to charts and the observer considers these easy to understand. Five points are given if from 21 per cent to 50 per cent of the exhibit is devoted to graphics and these are considered easy to understand. No points are given if more than 50 per cent of the exhibit is devoted to charts, graphs, or diagrams, or if the graphics are not considered by the observer to be easily understood.

The third item relates to the reading ease of the exhibit. While several objective measures of reading ease are available and can be used at the time an exhibit is being constructed, these objective measures require too much time to be employed on the exhibit floor.[6, 3, 10] In lieu of this, each observer is asked to group the exhibits he observes into 3 categories: the 3 that are most difficult from the standpoint of vocabulary and sentence length, the 3 that are least difficult, and the remainder which fall between these 2 groups. (Since in this evaluation, each evaluator observed 8–10 exhibits, this meant the groups were approximately thirds.) Ten points are credited for exhibits that are identified as "least difficult," 5 points for those that fall into the intermediate group, and 0 points for those that are judged "most difficult." Since this is a comparative method of scoring, the average score for a group of exhibits should always be 5 points.

The fourth item is concerned with the time required to read the complete exhibit, for a number of studies have shown that few people spend more than one minute at a single exhibit unless the exhibit is especially successful in sustaining interest. Ten points are credited if the observer indicates that the exhibit can be read in less than 2 minutes for each 8 feet of exhibit space. Five points are given if from 2 to 5 minutes of reading time are required for about 8 feet of exhibit space (one booth space). No points are credited if more than 5 minutes is required per 8 feet of exhibit space.

Several supplementary items are combined to form a fifth category—whether a qualified attendant is present, whether visual aids such as slides and movies are used as an integral part of the exhibit and these contribute to

learning, and whether literature is distributed which helps to reinforce the message of the exhibit. Five points are credited if any one of these 4 conditions is fully satisfied. Ten points are credited if 2 or more of these specific conditions are satisfied.

Items Concerned with the Dynamic Aspects of Exhibit Success (50 points)

If the exhibitor's purpose is to be satisfied, observers must really understand the point of his message, that is, the purpose of his exhibit. It is necessary that this primary purpose be correctly interpreted because the success or failure of his entire program may hinge upon this. At the same time, the information provided in the exhibit must be such that the observer finds something that will satisfy his wants or help him to achieve his goals. It is most likely to be successful if it offers an opportunity to act in fulfilling a personal purpose. Unless it ties in with his interests and goals, it is not likely to be meaningful and useful to him. To the degree that the information fails to interest and make sense to him, he cannot be reached psychologically even though he may be physically present.[7]

The first item here is concerned with the question, "Does the exhibit impart the message it was designed to impart?" As a step in obtaining the data to answer this question, each exhibitor is asked prior to the meeting to complete this statement in 25 words or less: "The main purpose of this exhibit is . . ." Each evaluator is similarly asked to complete this same statement without assistance.

The score on this item is assigned in proportion to the degree of agreement between the exhibitor's and the observers' statements of the purpose of the exhibit. In this evaluation, 5 members of the Scientific Exhibits Committee independently compared these statements of exhibit purpose and judged the degree of agreement on a 0–25 point range. Their pooled judgment on the degree of agreement between the exhibitor's statement of purpose and the statements made by 3 independent evaluators are used in crediting a score for a specific exhibit.

A second item asked, "Does the exhibit tie in with the interests of the visitor and offer him a chance to participate in satisfying a personal purpose?" An answer to this was obtained by asking each observer to check "yes" or "no" to the following question: "Do you believe most APHA members would gain something of personal interest and value from the exhibit?" Ten points were credited if this question was answered "yes"; no points were credited if it was answered "no."

The final item is concerned with the question, "Does visitor get a chance to act in satisfying a purpose?" Fifteen points is credited if an exhibit offers a visitor a chance to act in some way to satisfy a personal purpose. A credit of 15 points is given if any one of several methods is used to involve the visitor in some purposive action. The observer is asked to describe any way in which the exhibit offers him a chance to act, so that the committee members can make the final judgment as to whether this criterion is satisfied.

FINDINGS AND DISCUSSION

Table 1 summarizes the findings using this evaluation schedule for scientific exhibits presented at the annual meetings of the American Public Health Association during 1949, 1950, and 1951. The average score for the 134 exhibits evaluated during this period was 52.6 out of a possible 100 points. The average scores for specific criteria covered by the schedule have been aligned with maximum possible scores to call attention to the possibilities for greater improvement.

TABLE 1

Evaluation Scores Obtained in Evaluating APHA Exhibits Grouped by Evaluation Criteria

	Average Score *		Maximum Possible Score	
Structural or Physical Aspects				
Is it physically possible to read the exhibit from the point of observation?	6.7		10	
Will all graphs, charts, and diagrams be clearly understood by the intended audience? Has the use of statistical presentations been kept at a minimum?	5.8		10	
Is the vocabulary and style of writing used such that the intended audience can comfortably follow and understand the exhibit?	4.9		10	
Does the exhibit sustain interest long enough to be read completely?	5.9		10	
Supplementary items (qualified attendant present, visual aids used, visitor-operated devices used and contributing to exhibit, literature supporting the exhibit objectives).	7.9		10	
		31.2		50
Dynamic Aspects				
Does the exhibit impart the message that it is designed to impart?	13.5		25	
Does the exhibit tie in with the interests of the visitor?	6.5		10	
Does the exhibit offer the visitor a chance to participate in satisfying a personal purpose?	1.4		15	
		21.4		50
		52.6		100

* Based on 134 scientific exhibits at three annual meetings of the American Public Health Association—1949, 1950, and 1951.

It may be noted that the average score for the 5 structural or physical criteria used was 31.2 out of a possible score of 50. Sizable improvements are possible on each of the 5 criteria summarized. It was observed that very few exhibits satisfied all of these relatively simple requirements for good communication; yet, failure to satisfy any one of these conditions would probably lead to inadequate communication.

An analysis of the scores on the dynamic criteria shows the average score for this area to be 21.4 out of a possible 50 points. In these areas, even greater opportunities exist for improvement.

In answer to the question, "Does the exhibit impart the message that it is designed to impart?" the exhibits attained an average score of 13.5 out of a possible 25 points. Very few exhibits fully satisfied this criterion. As a matter of fact, some exhibits failed completely on this criterion. For such exhibits, none of the observers mentioned in any way the purpose identified by the exhibitor as the primary aim of his exhibit.

The weakest link in the exhibits as observed in this evaluation study has been the failure of many exhibits to satisfy the purposes and interests of the observers or to provide them with an opportunity to act in some way to satisfy a purpose. As shown by the score of 6.5 out of a possible 10 points, many of the APHA members believed that some of the exhibits failed to offer anything of personal interest and value to observers like themselves. Very few of the exhibits provided the visitor with an opportunity to act in some way to satisfy a purpose as shown by the score of 1.4 out of a possible 15 points. While this is a particularly difficult criterion to satisfy in an exhibit, studies have shown that it is one of the most important factors in exhibit success. More attention could profitably be devoted to identifying ways in which exhibits can be developed to meet this criterion.

What can exhibitors do to improve their exhibits? The findings reported in Table 1 suggest many areas exhibitors can profitably explore. The evaluation schedule offers some suggestions for testing the exhibits prior to showing them at scientific meetings. Every one of the criteria identified can be pretested at little or no cost in advance of an exhibition. Even partial exploration in these areas seems certain to yield benefits.

The detailed evaluation schedule and method of scoring has been attached for the interest and use of those who would like to test their own exhibits or explore further some of the possibilities for evaluation.

Obtaining a perfect score of 100 for an exhibit using the evaluation schedule described here will not guarantee exhibit effectiveness. Many aspects of exhibit effectiveness are still unknown. Further studies are necessary to identify these unknown aspects and to test their influence under controlled conditions. The present schedule is concerned with measuring certain intermediate conditions that have already been identified. Satisfaction of these conditions is essential if an exhibit is to be fully successful. If these conditions are satisfied, the exhibit is much more likely to achieve its purpose. If they are not satisfied, failure is certain.

Evidence that the specific purposes of an exhibit have been achieved is the only completely valid criterion of exhibit success. Such evidence cannot be obtained within the very brief time limit of an annual meeting and under the limiting conditions that exist. Very few control studies of exhibit effectiveness have been made because of the difficulties of maintaining controls over a long enough period of time so that the measurements can be made of the exhibit's influence on behavior. While waiting for such studies to be carried out, data already available on the intermediate requirements or conditions that have to be satisfied in order for an exhibit to be effective can be applied through various methods of pretesting.[8, 9]

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Confidential! **This questionnaire is the exclusive property of the APHA Committee on Scientific Exhibits and must be returned to the committee after completion of scoring.** ***No portion of it is to be used without permission.***

EXHIBIT EVALUATION QUESTIONNAIRE

APHA EXHIBITS

1. Can you read the exhibit from the point of observation?
   a. Is the print large enough to permit the main theme to be read from the aisle? Yes....No....
   b. Is your view of the exhibit theme free from obstruction by such things as coats, vases, flowers, etc.? Yes....No....
   c. Does the lettering stand out in sufficient contrast to the background? Yes....No....
   d. Is the source of light protected from the view of the observer? Yes....No....

2. Limited use of graphics.
   a. Are any charts, graphs, or diagrams used? Yes....No....

   If yes:
   b. How much of the exhibit is devoted to charts, graphs, tables, or other presentations of statistical findings?
   20% or less..... From 21% to 50%..... More than 50%.....
   c. Are all charts, graphs, and diagrams easy to understand? Yes.. No....

3. Reading ease.
   On a separate form you will be asked to indicate the exhibits that are *most difficult* and the exhibits that are *least difficult* from the standpoint of vocabulary and sentence length. Be sure to make these ratings as soon as you have seen all the exhibits that you are evaluating.

4. Estimate the length of time required to read the complete exhibit. (Check one.)
   a. Less than 2 minutes per 8 feet of exhibit space (i.e., one exhibit space) .....
   b. Between 2 and 5 minutes per 8 feet of exhibit space .....
   c. More than 5 minutes per 8 feet of exhibit space .....

5. Supplementary items.
   a. (1) Is attendant present? Yes....No....
   (2) Is he qualified to discuss the materials presented in the exhibit? Yes....No....
   b. (1) Are slides, movies, or other visual aids used in the exhibit? Yes....No....
   (2) Are these an integral part of the exhibit? Yes....No....
   c. (1) Are visitor-operated devices (such as buttons or levers) used to activate the exhibit? Yes....No....
   (2) Do such devices contribute to learning or to fulfilling the purpose of the exhibit? Yes....No....

d. (1) Is literature distributed? Yes....No....
(2) Does the literature help to reinforce the message and main points of the exhibit? Yes....No....

6. Does the exhibit impart the message it was designed to impart?
Please complete this statement in 25 words or less:
The main objective of this exhibit is.....

.....

7. Does the exhibit tie in with the interests of the visitor and offer him a chance to participate in satisfying a personal purpose?
a. Do you believe most APHA members would gain something of personal interest and value from the exhibit? Yes....No....
b. Does visitor get a chance to act in satisfying a purpose by: (Check any of the following that apply.)
(1) (a) Taking an information test or filling out an opinion questionnaire related to purpose of exhibit? Yes....No....
(b) If a test is given, are the correct answers given out immediately? Yes....No....
(2) (a) Taking a physical examination of some sort *(related to the purpose of exhibit)* such as a test for blood type, blood sugar, blood pressure, reaction time, vision test, hearing test, weight, height, self-taken photograph? Yes....No....
(b) Are the results of the examination made known to the individual? Yes....No....
(3) Taking part in a *planned* discussion on the exhibit topic? (This does not include casual d'scussion or informal conversation with attendant) Yes....No....
(4) Acting in some other way in relation to the exhibit purpose? Yes....No....

If yes, describe:.....

SUPPLEMENTARY RATING SHEET

APHA EXHIBITS

3. *Reading ease:*
Of the exhibits you are evaluating, which ..... are *Most Difficult* and which ..... are *Least Difficult* from standpoint of *Vocabulary* and *Length of Sentences?*

a. *Most Difficult*

1. .....

2. .....

3. .....

b. *Least Difficult*

1. .....

2. .....

3. .....

c. *Exhibits not included in either of the above lists*

1. .....

2. .....

3. .....

4. .....

5. .....

EXHIBIT EVALUATION QUESTIONNAIRE

Score Sheet

Structural or Physical Aspects	*Points*
Question 1. Absence of obstructions	10
Score: *10 points* if a, b, c, and d of Question 1 are all checked "yes"	
0 points if either a, b, c, or d of Question 1 is checked "no"	
Question 2. Limited use of graphics	10
Score: *10 points* if 2a is checked "no"	
10 points if 2a is checked "yes" *and* 2b is checked "20% or less" *and* 2c is checked "yes"	
5 points if 2a is checked "yes" *and* 2b is checked "From 21% to 50%" *and* 2c is checked "yes"	
0 points if 2a is checked "yes" *and* 2b is checked "more than 50%" *and/or* 2c is checked "no"	
Question 3. Reading ease	10
Score: *10 points* if exhibit is listed as one of the 3 least difficult	
5 points if exhibit is listed in the intermediate group	
0 points if exhibit is listed as one of the 3 most difficult	
Question 4. Short reading time	10
Score: *10 points* if the time required to read the exhibit is less than 2 minutes per 8 feet of exhibit space (i.e., one exhibit space)	
5 points if the time required to read the exhibit is between 2 and 5 minutes per 8 feet of exhibit space	
0 points if the time required to read the exhibit is more than 5 minutes per 8 feet of exhibit space	
Question 5. Supplementary items (qualified attendant present, visual aids used, visitor-operated devices used, and contributing to exhibit, literature supporting the exhibit objectives)	10
Score: *5 points* each for a, b, c, and d when *both* 1 and 2 are checked "yes". Total score not to exceed 10 points	

Dynamic Aspects	*Points*
Question 6. Satisfaction of exhibitor's purposes	25
Score to be assigned in proportion to the degree of agreement between exhibitor's and evaluators' statements of the exhibit objectives	
Question 7. Satisfaction of observer's purposes	
a. *0, 5, or 10 points* to be scored for 7a depending on the answers of the 3 evaluators for the exhibit. (Check responses given by each evaluator.)	10
Score: *10 points* if all judges say "yes"	
5 points if one or two judges say "yes"	
0 points if all judges say "no"	
b. *15 points* for 7b as follows	15
Score: *15 points* if b-1a and b-1b are *both* checked "yes"	
15 points if b-2a and b-2b are *both* checked "yes"	
15 points if b-3 is checked "yes"	
15 points if b-4 is checked "yes" *and* the description clearly indicates some action in relation to the exhibit purpose	
	100

SUMMARY OF EVALUATION
OF APHA EXHIBITS

Exhibit sponsored by .....

	Observer 1	2	3	*Composite (Average)*	*Not to Exceed*
1. Is it physically possible to read the exhibit from the point of observation?	....	....	....	.....	.....
2. Will all graphs, charts, and diagrams be clearly understood by the intended audience? Has the use of statistical presentations been kept at a minimum?	....	....	....	.....	.....
3. Is the vocabulary and style of writing used such that the intended audience can comfortably follow and understand the exhibit?	....	....	....	.....	.....
4. Does the exhibit sustain interest long enough to be read completely?	....	....	....	.....	.....
5. Supplementary items (qualified attendant present, visual aids used, visitor-operated devices used, and contributing to exhibit, literature supporting the exhibit objectives)	....	....	...	.....	.....
6. Does the exhibit impart the message that it is designed to impart?	....	....	....	.....	.....
7a. Does the exhibit tie in with the interests of the visitor?	....	....	....	.....	.....
7b. Does the exhibit offer the visitor a chance to participate in satisfying a personal purpose?	....	....	....	.....	.....

Dental Personnel for Local Health Units*

Dental Health Section

IT has been stated that the lack of dental personnel has retarded the development of public health dental programs in local health units. The Committee on Dental Personnel for Local Health Units was unable to obtain up-to-date factual information from reports or literature that would show the number of dentists, hygienists, or other personnel employed by local health units, either on a full-time or part-time basis.

In order to evaluate the local dental health problems, one should have base line data on present dental public health personnel in order to know if the present demands are being met and to determine further needs. A larger public is demanding more dentistry in public health since the rapid expansion of dental preventive services. The need for more well trained dental personnel for this work is evident.

It is proper for this Section to take the initiative in showing what the needs are and what portion of the personnel is available to do the job. To obtain this information as close to the source as possible, a rather lengthy questionnaire was sent to all the state dental directors for their completion and return. From the remarks on some of the returned forms, one can readily conclude one thing — that dental directors do not like questionnaires. This may also apply to the administrative officers.

To evaluate the questionnaires, a table was designed whereby information could be tabulated in columns by states. Thirty-two of the states completed most of the questionnaire while several others replied but failed to fill in the form. Most of those failing to complete the questionnaire were small states, or states where there is no dental director. In some states the dental directors were not permitted to participate in the survey; while in others it is evident that participation was biased in order to please other public health officials and thus did not express the true views of the dental directors.

Following are the results of the survey:

Question One—How many local full-time health departments do you have in operation in your state?

(a) 30 states reported.
(b) 747 local health units are in operation, representing an average of 25 units per state.
(c) Of those states reporting, only 3 had complete state coverage of local full-time health departments.

Question Two—What is the average population served by a local health unit?

(a) 26 reported.
(b) Population range varied from 12,000 to 2,000,000.
(c) Average population per unit is 354,847 (includes large city units).
(d) Median population per unit is 60,000.

Question Three—How many of these local health units employ full-time dentists, hygienists, dental assistants, and other dental personnel?

(a) Of 30 states reporting, 61 units employed full-time dentists, representing an average of 2.03 such units per state.
(b) Of 29 states reporting, 77 units employed

* Report of the Committee on Dental Personnel for Local Health Units.

dental hygienists, representing an average of 2.5 such units per state.
(c) Of 28 states reporting, 23 units employed dental assistants, representing an average of 0.8 such units per state.
(d) Of 27 states reporting, 5 employed miscellaneous personnel, representing an average of 0.2 such units per state.

Question Four—Are dental personnel employed full-time in local health departments permitted to conduct a part-time practice after regular hours in the health department?

(a) 6 reported yes.
(b) 16 reported no.
(c) 10 gave no answer.

Question Five—How many local full-time health departments within your state employ part-time dentists, hygienists, dental assistants, and other dental personnel?

(a) Of 30 states reporting, 302 units employed part-time dentists, representing an average of 11.1 such units per state. Since one state reported 164 units employing part-time dentists the median, 3, is a better example.
(b) Of 25 states reporting, 28 units employed dental hygienists, representing an average of 1.1 such units per state.
(c) Of 28 states reporting, 28 units employed dental assistants, representing an average of 1 such unit per state.

Question Six—How much time of the part-time dental personnel employed by local health departments is devoted to dental public health?

(a) 19 states reported.
(b) 41.7 per cent was the average reported.
(c) This is equivalent to approximately 100 full-time dentists, or an average of 3 to a state.

Question Seven—Do part-time dental personnel provide remedial services, educational services, or preventive services?

(a) Remedial: 20 yes—3 no—8 no answer.
(b) Educational: 16 yes—7 no—9 no answer
(c) Preventive: 16 yes—6 no—10 no answer.

Question Eight—What part of the part-time dental personnel's time is devoted to prevention, correction, and education?

(a) Prevention: Approximately 28 per cent.
(b) Education: Approximately 22 per cent.
(c) Correction: Approximately 50 per cent.
Approximate percentages were given because of unequal reporting by the states.

Question Nine—If full-time personnel are employed, what services do they generally offer and what part of their time is devoted to each of the full-time services?

(a) Remedial: Approximately 60 per cent.
(b) Preventive: Approximately 15 per cent.
(c) Education: Approximately 20 per cent.
(d) Evaluation: Approximately 5 per cent.
Approximate percentages were given because of unequal reporting by the states.

Question Ten—What are the salary ranges of dental personnel employed by local full-time health departments?

(a) Full-time dentists: Average minimum—$5,193 (13 reporting); median minimum—$5,200 (13 reporting); average maximum—$7,373 (12 reporting); median maximum—$8,000 (12 reporting).
(b) Full-time hygienists: Average minimum—$2,596 (12 reporting); median minimum—$2,610 (12 reporting); average maximum—$3,434 (11 reporting); median maximum—$3,300 (11 reporting).
(c) Full-time dental assistants: Average minimum—$1,654 (8 reporting); median minimum—$1,800 (8 reporting); average maximum—$2,220 (7 reporting); median maximum—$2,160 (7 reporting).

Question Eleven—Are full-time dental personnel employed by local health units under Civil Service?

(a) Yes—15.
(b) No—8.
(c) No answer—9.

Question Twelve—If answer is yes to number eleven, what are the minimum

requirements for the employment of a public health dentist?

(a) 13 reported.
(b) Dentists—D.D.S. and state license (all states).
(c) Dental hygienists—Graduation from an approved school of dental hygiene and state license (all states).
(d) Dental assistants—Graduation from high school (all states).

Question Thirteen—Is dental public health a required service in local full-time health departments?

(a) Yes—3 (New Hampshire, Delaware, and District of Columbia).
(b) No—27.
(c) No answer—2.

Question Fourteen—Should dental public health be made a required service in local full-time health departments?

(a) Yes—20.
(b) No—8 (many stated "no" because of lack of funds or professional personnel).
(c) No answer—4.

Question Fifteen—In order to provide an adequate dental public health program, what is the optimal public health dental personnel needed to serve a population of 50,000 people?

(a) Dentists: Average 5.7; median—2 (21 reporting).
(b) Hygienists: Average—9; median—3 (21 reporting).
(c) Dental assistants: Average—7.6; median—2 (20 reporting).
(d) Others: Average—1.3; median—1 (7 reporting).

Question Sixteen—If dental public health should be made a basic health service for local health units, would dental personnel be available for your present needs? If answer is no, what percentage could be available?

(a) Yes—5
(b) No—23.
(c) No answer—4.
(d) Median per cent available—15; average per cent available—26.

Question Seventeen—If one public health dentist should be required for each local health unit with 50,000 people or more, how many full-time dentists would be required for your present needs? Number required for complete coverage?

(a) Present needs: Average—17; median—16 (23 reporting).
(b) Complete coverage: Average—60; median—51 (20 reporting).

Question Eighteen—Why is public health dental service not provided in all your local health departments?

(a) Lack of finance—27 states.
(b) Lack of personnel—23 states.
(c) Lack of administrative interest—12 states.
(d) Lack of public interest—12 states.

A few states checked all four items, others checked three, while almost all checked both lack of finances and personnel.

Question Nineteen—Do vacancies exist in local health units within your state full-time public health dental personnel?

(a) Dentists: Median number of vacancies—4.5 (7 states reporting).
(b) Hygienists: Median number of vacancies—6 (9 states reporting).

Question Twenty—What portion of salaries or fees usually paid to public health dental personnel in local health units are provided by federal, state, and local health departments?

(a) Federal: Median—Approximately 20 per cent.
(b) State: Median—Approximately 20 per cent.
(c) Local: Median—Approximately 20 per cent.

Approximate percentages are given because of unequal reporting by the states.

In evaluating this report one can see a definite pattern that needs correcting as rapidly as possible.

1. Professional dental personnel is far

short of the present needs in view of the increasing number of local health units and demands for dental service. It should become the duty of every state dental director to encourage more young dentists and hygienists to enter the field of public health. Also, we should encourage the establishment and expansion of more training schools for such personnel.

2. The present programs are not equally divided into the three basic dental health services; remedial services being first, preventive second, and education third. Perhaps time will place preventive first.

3. When compared to other personnel in local health units with equal training, the salaries of the public health dentists are perhaps second only to the medical profession but are still too low to attract good dentists away from private practice in the quantity needed. Better Civil Service and retirement plans will help in this direction.

4. It is evident that dental public health is a desirable service in the local health unit and should become a regular service if personnel and finances are made available.

5. The number one block in the expansion of dental services in local health units is finance. If public interest is strong enough, this block should be removed at the local, state, and federal levels.

6. Appropriation for dental public health, especially from state and federal sources, will help make dentistry a basic service in local health units.

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Progress in the Design of Rural Sewage Disposal Systems*†

Engineering Section

THIS is the first report offered by the present committee. The objective of the committee during 1951–1952 has been to gather factual information concerning the status of progress on research in the design of rural sewage disposal systems. The objective for next year is to establish standards of design acceptable to federal, state, and local interests.

In 1945, approximately 17,000,000 persons were served by home sewage disposal systems. In current residential building construction, it is estimated that 40 per cent of the homes being built with federal mortgage insurance assistance are dependent upon individual systems for sewage disposal. Most of these installations are served by septic tanks and subsurface tile fields. It has also been estimated that approximately 80 per cent of the sewage in a single county of 500,000 population is disposed of through septic tanks.

As a result of the problems encountered with this increasingly important method of sewage disposal, there has been a great deal of research "to establish the factual foundations for effective design concepts."[1] In adequate areas, where the soil is suitable and the systems are properly designed, the septic tank-tile field method of disposal will give very satisfactory results. It is the best available substitute for public sewerage and sewage treatment facilities. It will not work, however, if the soil is unsuitable. It will not work satisfactorily in areas where ground water table is high, in impervious clay, in certain types of soils which swell after wetting, in areas where there are prolific outcrops of rock, in quicksand, or in areas where hardpan, rock or other impervious material is found below a shallow stratum of sand or other pervious material, or where the disposal areas are inadequate. Neither will it work for very long unless the sewage is properly conditioned for subsurface disposal. The purpose of the septic tank is to provide such conditioning. If this purpose is to be accomplished, the septic tank must be large enough and it must be properly designed.

SEPTIC TANKS

The most significant studies concerning the performance and effective design concepts of septic tanks have been undertaken by the U. S. Public Health Service Environmental Health Center in Cincinnati, under joint sponsorship of the Housing and Home Finance Agency.[1] These studies have confirmed earlier reports[2] that liberal capacity is not only important but is also good economy. The studies have also confirmed previous indications that compartmentation of large septic tanks may be advantageous. The results reported to date appear to favor a two-compart-

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* Progress Report.
COMMITTEE ON RURAL SANITATION.
Organized 1947. Published Reports: *Year Books*, 1947–1948, 1948–1949, 1950–1951.

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ment arrangement, either of equal compartments or with about two-thirds of the total capacity in the first compartment.

It should not be inferred from the foregoing, however, that a well designed single compartment tank of ample capacity will not give good performance. Neither is it intended to be inferred that there should be any serious objection to ratios of length-to-width somewhat larger than 3:1. This consideration may be significant with respect to larger septic tanks, employed by schools, restaurants, etc., where elongated battery-type construction may be more economical.[3] In other words, none of the results to date have demonstrated such marked improvements through changes in design as would justify adequately a radical departure from present practices or requirements of most health departments. The simplicity of construction of the one-compartment tank, for example, may well outweigh any advantages of multiple compartmentation. The committee recognizes that unless suggested changes would have a marked advantage over present practices, they would only serve to confuse the average contractor or builder and add to the nuisances and worries of the already overburdened sanitarian.

The following is a summary of some of the conclusions from the Environmental Health Center studies on septic tanks:

1. Variations in shape had little, if any, effect on suspended solids removal. Cylindrical, rectangular, rounded end, and oval types were tried.

2. An unbaffled sewer inlet, a baffled inlet and a tee-fitting inlet were all essentially equivalent in their effect on detention time, but the tee provided a slightly better flow pattern. Invert elevations were three inches above the liquid level in each tank studied. (Note: Although tee inlets are satisfactory in their effect upon detention time, they have disadvantages. In Alachua County, Fla., for example, they have led to clogging by congealed grease. In many old installations they have been removed to overcome this difficulty).

3. The 50 per cent increase in total tank capacity recommended by the Joint Committee on Rural Sanitation for installations receiving ground garbage appears to be a reasonable precaution. It is recognized that this recommendation has little basis in demonstrated research, but represents the best evaluation of available data on actual field practice.

4. The functional operation of a septic tank is not usually improved by the addition of chemicals, and some chemicals appreciably impair their operation. But there is no evidence that the use of household detergents in small quantities will affect the proper functioning of septic tanks. If the tanks are of ample capacity, no artificial "starters" are needed.

ABSORPTION FIELDS

Enormous amounts of septic tank effluents are applied to soil absorption fields. In some absorption fields, settled sewage is applied at rates upward of 200 inches annually. This is much greater than the average rainfall in most parts of this country, which ranges from about 30 to 50 inches a year.

It is necessary to explore fully the absorption characteristics of the soil before embarking upon construction of sewage absorption fields. Methods of estimating these characteristics have been studied intensively during the past three decades. They were apparently started by the New York State Department of Health. To the certain knowledge of several members of this committee, they were studied intensively by individuals in that department during the period from 1936 to 1947, at least. More recently, organized research on the problem has been conducted at the Environmental Health Center in Cincinnati, the University of California, the University of Florida, and at other institutions. In addition, similar studies have been continued by a number of health departments. Consequently, a vast quantity of firsthand information has been obtained on this important point. Recently, however, there has been

a considerable amount of misunderstanding or misinterpretation of the published data. While there is no unanimity of opinion even among the committee members in regard to the necessity of continuing some phases of present research projects, individuals on the committee were selected with the object of obtaining the widest possible divergence of views on the subject. One of the purposes of this report is to clear up misunderstandings or misinterpretations that have occurred in the past.

In order fully to appreciate the reasons for conflicting opinions in the past, and in order to understand the explanations herein contained, it is necessary first to consider the background which led up to present developments. The following historical summary should answer most of the questions concerning the validity of present procedures.

HISTORY OF PERCOLATION TESTS

Although soil texture and permeability have long been of concern both to soil scientists in agricultural institutions and to engineers interested in soil physics or soil mechanics, the first practical test for measuring the ability of soil to receive sewage is believed to have been developed in 1926 by Henry Ryon. It was based on his experience with the New York State Department of Health. Your committee chairman was well acquainted with Mr. Ryon and obtained much firsthand information from him concerning the test. Ryon recognized from the start that there was an initial "blotting effect" at the beginning of tests in dry soil, and he emphasized the necessity of having the soil thoroughly wet before measuring the percolation rate. In his first official publication on the subject he mentioned in two places the necessity of eliminating the effect of a dry soil.[4] Even during Ryon's time, however, the engineers who were expected to make the tests were overburdened with other duties and he foresaw that it would be necessary to keep the test as simple and as rapid as possible if it was to become widely accepted.

In the 1930's, the late Arthur S. Bedell, then chief of the Bureau of Sewage and Waste Disposal, Division of Sanitation, New York State Department of Health, was instrumental in establishing a policy requiring soil percolation tests for each subsurface sewage disposal system approved by that department. Such tests were either witnessed or actually performed by district engineers in some 20 health districts.

This policy was carried out scrupulously. Initially, the tests were performed in strict accordance with the department's rules and regulations from which the following is quoted: "To eliminate the effect of a dry soil the test should be repeated and the slower rate of percolation used."[5] Readings were never taken officially until the soil had become fairly soaked. The directions outlined in the rules were followed for about a year or so, until Stanley T. Barker, who later succeeded Mr. Bedell in his position, accompanied your committee chairman on a field investigation during which numerous tests were made over a large area. Time was of the essence and the tests had to be completed in one day. This required an improvement in the method of making the test. It proved to be a short-cut method when tight soil was encountered. The same sort of hole was used as before, but instead of filling the holes to a depth of merely 6 inches, they were filled practically full and measurements were not begun until the rate of drop of the water surface began to taper off. The measurements were made from a batter board across the top of the hole and were continued until the rate became *constant* for a selected interval of time. They were discontinued when the percolation rate became definitely

asymptotic; that is to say, when there was no measurable decrease in the rate at which the water level dropped during one-minute, five-minute, 30-minute, or longer intervals of time.

From 1937 to 1947, results of percolation tests made by the two methods were observed countless numbers of times. It was not uncommon to make 50 or more tests in a single real estate subdivision. Sometimes, areas for six or more proposed real estate developments were investigated during a single month in one district. The soil varied from sand to impervious clay, and the subsoil from gravel to solid rock. Water tables varied from a few inches to many feet below the surface. Observations during the tests led to the conclusion that the newer method worked out better than the older one. The procedure of continuing measurements until the drop per unit of time became *constant*, gave results somewhat more conservative than those obtained by the widely adopted method of repeatedly filling the test hole to a 6-inch depth, but there was *no appreciable difference* in the results if the hole had been filled often enough "to eliminate the effect of a dry soil." It was always recognized, of course, that certain subsoil conditions would have an important effect upon the functioning of subsurface sewage disposal systems. Indeed, the application for approval of plans of subdivisions required information on the maximum and minimum elevations of the ground water table, in addition to a description of the nature of the subsoil. Descriptions and thicknesses were required for the various strata to a depth of 10 feet where tile fields were proposed, and 20 feet for leaching pits. As in any engineering investigation, cognizance was fully taken of this information in interpretations of the test results. The observations and experiences during this work led to a healthful respect for the percolation test.

The validity of the test was further substantiated by repeated observations and studies of old tile fields that had been designed and constructed in accordance with the New York State rules and regulations years before the 1937–1947 decade. The experiences lent credence to the belief that percolation tests should usually be repeated and the results duplicated for each subsurface disposal system to be constructed.

A simple empirical formula for use as a standard in determining the area of absorption fields designed for a life expectancy of about 20 years was developed in Bulletin No. 23 of the Florida Engineering and Industrial Experiment Station in December, 1948.[2] It required the determination of percolation time by the following technic:

1. Dig a hole about 1 ft. square to the depth at which it is proposed to lay the tile drain.
2. Fill the hole with water and allow the water to seep away. When the water falls to within 6 or 8 inches of the bottom of the hole, observe the rate at which the water level drops.
3. *Continue these observations until the soil is saturated and the water seeps away at a constant rate. (Keep adding water until the rate becomes constant.)*
4. Compute the time required for the water to drop 1 inch *after the soil becomes saturated.*

It is to be noted especially that the directions call for a continuation of the test until the soil becomes saturated and until the water seeps away at a constant rate. In other words, the test cannot be considered complete until a condition of equilibrium is reached; that is, within the limits of the accuracy of field measurements which, of course, are much more precise than estimates of the amount of sewage to be treated in the proposed absorption field.

Another formula for determining the capacity of soils for leaching sewage effluents was published in May, 1949.[6] This formula is more complicated but it represents a sound engineering approach to the problem. It has the

advantage of eliminating a field evaluation as to the time that tapering off occurs. It is not even necessary to wait until tapering off occurs, since the equilibrium or asymptotic rate may be calculated from the pattern of change in rate as indicated by accumulated measurements. It will also indicate the influence of lower strata of different permeability, and this is especially important if the tests are made by an inexperienced operator who is not capable of evaluating the subsoil conditions. In other words, the formula is equally as foolproof as the earlier one. Both formulas give the same percolation rates, however, as accurately as these rates can be determined by field measurements. The most important difference in the two suggested methods is concerned with the allowable sewage loading rates. The author of the second formula recommends an allowable rate of 5.0 per cent of the absorption rate measured by the percolation test. The other recommends allowable sewage absorption rates ranging from 0.45 to 2.9 per cent of the rate by the percolation test; with an average near 2.5 per cent.[7] Data recently developed by other investigators may be interpreted as suggesting an average 2 per cent loading rate.[8]

Four modifications of the percolation test have recently been suggested by other workers.[9] These include the use of a 4-inch auger hole, replicate tests, soaking overnight before making the test, and using the later period of the test as being more representative of the true absorption rate of the soil.

Use of a 4-inch auger hole should be satisfactory. The use of a hole about 12 inches square was suggested by Ryon only because it was considered most convenient, or because shovels with which to make the larger hole are more readily available than augers or post hole diggers. That the size of the hole is relatively unimportant has been observed on many occasions. Quantitative studies were recently made at the University of Florida, for example, on 1 x 1, 1 x 3, 2 x 2, and 1 x 4 ft. holes. Some differences in percolation rates were observed, but the differences are insignificant when compared to variations in dosing intervals and in the quantity and composition of sewage from individual homes. Data recently furnished by the U. S. Public Health Service indicate that water consumption in a group of homes averaged 39 gallons per person per day in winter and 49 in summer, varying from 8 to 150 gallons per person per day in winter and 8 to 226 in summer. In the light of these wide variations, there is considerable doubt as to the feasibility of meticulous refinements to the percolation test. At the same time, however, it is believed that standardization and agreement are needed on the size of the test hole. Experience has demonstrated that an operator who is careless in the preparation of a test hole is likely to be careless also in reading the percolation rates.

The second suggestion, concerning replicate tests, is a very good one. Percolation rates should always be checked by tests in separate holes until the results are consistent or assuredly authentic. The fourth suggestion, that results during the last portion of the test be used in computing the percolation rates, is also good and it is in accordance with recommendations by others. In fact, compliance with the suggestion is guaranteed in the requirement that the rate be computed on the basis of drops in water level after the soil becomes saturated and a condition of equilibrium is reached.

There is a real question, however, as to the recommendation that the test holes be filled with water and allowed to soak overnight before making the percolation test. The suggestion has merit as a procedure to be followed by an inexperienced individual or by a real estate developer who may be required

to prepare test holes at specified locations and have them ready for checking by a representative of a health department at a given time. Where such a procedure is followed much time can be saved by the inspector. But it is not believed that a practice of overnight soaking is likely to be followed by most health departments which are already grossly understaffed, when the labor involved has to be performed by a member of the staff. Neither is it believed that the procedure can be justified in the light of such concurrent inaccuracies as those invoived in estimates of predicted loads—inaccuracies which are much more far-reaching in their effect upon the life of the installation to be designed on the basis of the percolation tests. Although there may be slight decreases in percolation rates on each successive test, and this is to be expected where "after precipitation" occurs in water used for the test, the differences are usually too small to justify the extra time required for prolonged tests. The differences are generally within 5 or 10 per cent of the values indicated by shorter conventional tests, and this is within the accuracy of field methods. When one considers the variations occurring in field construction methods, the requirement for overnight tests appears to represent a practice of straining at a gnat while swallowing a camel.

The question concerning overnight tests, however, is raised primarily for the purpose of soliciting comments based upon actual experiences of other members of the Engineering Section. The majority on the Rural Sanitation Committee share in a conviction that there is no substitute for such field experience in the promulgation of reasonable or acceptable standards of design which is the real objective of the committee. It is sincerely urged that anyone with competent comments and constructive criticism on any phase of this report furnish the committee with information or statements which may be helpful in drafting standards that are reasonable or realistic. This invitation is not extended, however, to mere armchair strategists. The supervision of a thousand or more percolation tests, or jurisdiction over the installation of a thousand or more subsurface disposal systems during a minimum period of 10 years, is suggested as a qualifying criterion.

While it is to be expected that there will be occasional failures in subsurface absorption fields regardless of the care taken in their design, such failures are rarely caused by misinterpretations of percolation tests carried to equilibrium by experienced persons.

The following are two pertinent but tentative conclusions from recent studies on absorption fields:

1. On the basis of what is now known, it is felt that an increase of about 35 per cent in absorption field area would be a reasonable precaution against failure due to the addition of ground garbage to the sewage.[1]
2. There is no evidence that absorption field areas need be increased because of the use of household detergents.[11, 12]

NEW DEVELOPMENTS

About half the states permit the use of cesspools and leaching pits which have been found more adaptable than absorption fields under local conditions. Where applicable, they are usually cheaper than absorption fields. They give excellent service if properly designed and constructed. Experience has shown that for seepage pits an effective absorption area equal to about 75 per cent of that in an absorption field is generally satisfactory.[2, 13] Other states prohibit such installations for good reasons. They are not suitable for use where water tables are high or where soil conditions do not provide adequate protection against contamination of the groundwater supply. Seepage pits near soft limerock formations are dangerous.

A household disposal system designed

TABLE 1

Summary of Data on 500-gallon Septic Tanks that Had Required Servicing

No. of Persons in Household	2	3	4	5	6	7
No. of Tanks	17	23	14	8	10	6
Average No. of Years Between Cleaning	8.75	7.50	6.25	5.50	5.25	4.75

to overcome some of the objections to leaching pits was developed about two years ago in Hollywood, Fla. In effect, it is something of a cross between a leaching pit and an absorption field. It consists of two rows of 4 x 8 x 16-inch concrete block, built up in place without mortar, and spaced 14 inches between rows. The blocks are laid lengthwise on a bed of three-quarter in. rock, 48 in. wide, and 6 in. thick. The blocks are covered with concrete slabs, the tops of which are usually laid about a foot below ground surface. The outside walls of the rows of block are surrounded with rock for an additional depth of 8 in. (total depth 14 in.) extending out 13 in. on each side to make up the 48 in. width. Septic tank effluent is discharged into the space between the blocks, onto a perforated concave longitudinal distributor of metal, asphalt composition, or other suitable material, about 7 in. wide, running the length of the built-up blocks.

The system is patented. So far, it has been found to work satisfactorily under the same conditions where an absorption field would be expected to function. Several failures have been reported, however, in areas having high ground water tables. An advantage of the system is that it requires less area than an ordinary absorption field.

GREASE TRAPS

Studies have recently been made at New York University on grease traps for use on lines receiving kitchen wastes containing synthetic detergents. The following is a summary of the more important conclusions from these studies: [10]

1. Grease traps which operate successfully in removing stearate soap-grease emulsions do not necessarily operate with equal efficiency in removing synthetic detergent-grease emulsions.
2. Increased temperatures aid in the separation of synthetic detergent-grease emulsions from the transport medium under the conditions studied.
3. Under the conditions studied, temperature increases accompanied by turbulence in the transport medium caused once separated grease-detergent emulsions to redisperse and remain so for 45 minutes or more, depending upon the type of detergent used.

OTHER STUDIES

As previously indicated, other studies producing results of value in the design of rural sewage disposal systems are being conducted by state and local health departments throughout the country. The Erie County Health Department in New York State has accumulated a vast amount of practical information and data on the subject. The chief of the Bureau of General Sanitation in that department has reported complete success with percolation tests made in accordance with the directions listed on page 101 of this report.

A comprehensive private investigation of 482 septic tank installations in one county was recently made by a student from the University of Florida. The results of value on design standards are much too extensive to be included in a committee report, but the causes listed for failures of septic tank systems are believed too significant to be overlooked at this time. The systems surveyed were apparently installed under close supervision. Thirty-four of the installations had clogged, 11 due to roots, and 23 due to deficiencies in maintenance or operation. Of the latter, difficulties with

9 had been due to broken tile; 5 were due to sand leaking in distribution boxes; 4 were due to clogging caused by toothbrushes, a skip rope and a roll of paper; 3 were due to rough edges on inlet baffles; and 2 were due to mortar blocking the tile drains. Table 1 is typical of pertinent information obtained on septic tanks.

A list of other studies being conducted on septic tank systems was published in the most recent report from the Environmental Health Center.[1]

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Radiological Health*

Engineering Section

THE Committee on Radiological Health was established by the Engineering Section to promote effective supervision by state and local health departments of the use of radiation producing machines and nuclear radiation producing substances. It was emphasized that the committee should concern itself with a positive long-range public health program to assist in the safe development of the atomic age.

Radiation effects have been noted for about 50 years. Before 1940 the known biological effects had been associated with relatively small professional groups, except for medical applications. A limited scientific and medical effort was made to assess the chronic effects of radiation. This was the situation when the atomic energy program began to expand.

Standards developed by the National Committee on Radiation Protection and its predecessors formed the basis for the design of protection equipment and an evaluation of radiation hazards. This involved the translation of the standards into units suitable for environmental measurements. Concurrently, physicists and engineers became prominent members of the health protection teams.

As research in connection with the atomic energy program progressed, it was apparent that the accumulative and chronic effects of radiation justified a review of radiation practices and exposures outside the nuclear energy industry.

The committee has also agreed upon tentative objectives, subject to correlation with the Subcommittee on Radiological Health of the Committee on Research and Standards.

OBJECTIVES OF THE ENGINEERING SECTION COMMITTEE ON RADIOLOGICAL HEALTH †

(As revised October 21, 1952)

1. Periodically advise personnel concerned with public health activities of the relative importance and rate of change of various radiation sources and exposures.
2. Serve as a clearing house for the organizational and legal aspects of the field.
3. Study existing technics used in detecting, measuring, evaluating, and controlling radiation so the health agencies will have a list of practical technics available (to be coordinated with other committees).
4. Promote selected training and educational activities in cooperation with appropriate professional organizations.
5. Encourage applications of radiation for the improvement of the public health.

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* Progress Report.
COMMITTEE ON RADIOLOGICAL HEALTH.
Organized 1951.
† Numbering indicates order of priority.

Tank Truck Milk Shipments from Farm to Plant*†

Engineering Section

THIS report on the shipment of milk from producing farms to pasteurizing plants by tank truck, represents a study recently made by the Committee on Milk Sanitation of the Engineering Section.

While this mode of milk transport is not new to West Coast areas, especially in California, it is of quite recent origin in other sections of this country. The popularity of this system of milk hauling is growing very rapidly. In one milk shed two bulk routes were started in August, 1951, and there are now 14 and others are planned.

In an effort to determine the opinion and comments of state milk control officials the committee sent inquiries to most of the states. Replies were received from 27 states and the District of Columbia. From the standpoint of official control, the replies pointed to three distinct phases of development in connection with this new problem in milk sanitation. First, no special regulatory measures had been established by 14 states replying because this type of transport was not now in use; second, the problem was being very closely watched in eight states and definite interest was being manifest by segments of the dairy industry in those states for this type of milk hauling. In one state milk tank shipments were being permitted on an experimental basis under a waiver of certain portions of the state milk code. Third, definite regulations setting forth specific requirements had already been promulgated, or were in process of preparation by the following states: California, Connecticut, New York, Oregon, and Washington.

In addition to the subject of regulations, the committee was also interested to learn the opinion of milk control officials relative to the impact of this new development on milk inspection procedures. The question was asked, "Do you feel this type of milk handling and transport will increase or decrease the amount of milk sanitation supervision by official agencies?" In studying the replies received, eight were of the opinion that more inspection and supervision time would be required; three believed supervisory time would be decreased, and six indicated that there would be no appreciable difference. There was universal agreement that sampling procedures would be markedly altered. The sanitarian would either drive ahead of the tanker or would ride on the truck and collect samples from the individual farms holding tanks along the route and right at the farm. Since many states have laws or regulations requiring periodic sampling of milk from individual producers, collection at the farm would seem to be mandatory. It is interesting to observe that as methods of commerce and industry change, official agencies must likewise revise and reappraise their control technics and procedures.

For the course of this study the committee received a large number of

* Report of the Committee.
Joint Committee on Milk Sanitation.

† Presented before the Engineering Section of the American Public Health Association at the Eightieth Annual Meeting at Cleveland, Ohio, October 23, 1952.

comments and opinions pertinent to this matter. In addition, articles and other available commentary were studied. Therefore, before discussing applicable regulatory measures, it appears timely to review briefly some of the pros and cons of this type of milk transport. Some of the advantages claimed are as follows:

1. Much hard labor necessary with the can system is eliminated and milk can repair and replacement is eliminated. The can itself, as a possible contributor of high bacteria counts, is likewise removed.

2. Loss of milk by stickage and spillage in and from milk cans is eliminated by the bulk system.

3. Milk quality may be improved due to rapid cooling with the bulk method, and milk arrives at the plant considerably cooler than is the case when shipment is by can.

4. Milk producers like the fact that they sell their milk in their own milk houses.

5. The producer can witness the sampling on his own premises and there is less misunderstanding over butterfat tests and bacterial count results.

6. The milk company will give more attention to farm sanitation practices because the rejection of a tank load of milk presents a much more critical problem than rejection of a few cans. In California, for example, a tanker with milk from several producers is considered a lot at its destination. If the product is not satisfactory, the entire lot is degraded and the receiving plant or purchaser must stand the loss.

Some of the disadvantages of the bulk system should also be noted:

1. From the viewpoint of the control official, more time and travel may be expended in the collection of milk samples. It will be necessary for the sanitarian to precede the tanker or to ride on the truck, if samples from individual producers are to be collected. In a comparable period of time, it is possible to obtain many more samples from the shipper's cans at the plant receiving platform.

2. The system is practical only among producers who have sufficient volume to justify the installation of costly farm milk tanks.

3. Sanitation problems can arise with a bulk system if the driver is careless in handling hose or pipe connections, or if the producer has been careless in his tank and equipment cleaning job.

4. Unless the milk company employs a well trained hauler or driver, who has had prior experience in judging milk flavor or odor, milk of "off" flavor might be mixed with the milk of other producers to the detriment of the entire load. (It is believed, however, that to avoid such a situation milk companies will be especially careful in their selection of tanker drivers. This in turn, will work to the advantage of all parties concerned.)

It would appear that the advantages of bulk tank shipment of milk outweigh the disadvantages and this seems to be the general opinion of control authorities who have had experience with this method of milk hauling.

As far as the control picture is concerned, from the standpoint of official agencies, there are a number of aspects of this problem which must be given careful consideration. Some of these are as follows:

1. *The Proposed Location of the Refrigerated Tank at the Dairy Farm*—It is quite possible that some producers wishing to adopt this system may not have sufficient space in existing milk houses. Therefore, the regulations should require milk houses of adequate size so that one or more tanks may be properly installed. In some current regulations, tanks are required to have a two-foot clearance from walls on all sides, and a clearance of not less than two feet between other equipment. The tank is required to be set on legs with a six-inch clearance between floor and bottom of tank.

2. *Adequacy of the Water Supply*—Since the washing operation is materially altered when bulk instead of can storage of milk is used, the adequacy and pressure of the water supply becomes more critical. Regulations must take cognizance of this and require water under pressure and a supply of hot water, also. The size of a hot water storage tank needed will vary with the volume of milk handled, but in one state a minimum size of 30 gallons has been designated.

3. *Precooling of Milk by Surface Cooler*—Prior to placing milk in the tank, cooling over a surface cooler may be done. If such is the case, it is the recommendation in one area that the cooler be mounted at least two feet from the tank. Milk from the cooler to the tank must be conducted through a sanitary pipe and entrance to the tank shall be through a port in the cover.

4. *Every Other Day Pick-up of Milk*—In a few areas today milk is collected at the farm on an every other day schedule. It is feasible to assume that there might be agitation to pick up the milk even less frequently. This is certainly a point upon which further study is needed. In one set of proposed regulations, milk cannot be held on the farm longer than 48 hours.

5. *Hose Connection from Tank to Truck*—Since milk in the storage tank is transferred to the tank truck by a hose connection, the matter of whether the milk house door may be used as the entrance for the hose is a point at issue. It is contended that the milk house door would not be left open any longer under this system than is true when cans of milk are loaded. One proposal in this regard is to require an opening in the milk house wall at least four inches above the floor for the entrance of the hose.

Another matter of significance is whether the hose shall be of flexible material or sanitary pipe. It appears that all authorities thus far raise no objection to the use of a Neoprene or Tygon plastic hose. This seems to be feasible and practical. No critical sanitary problems appear to have been created when this material is used. It is, however, specified that hose length shall not exceed eight feet in single section. If longer hose is needed two sections may be used. Hose fittings are required to meet 3-A standards.

6. *Washing and Sanitizing the Farm Tank*—The advent of cold wall and refrigerated storage tanks on the farm has transferred to the producer some of the wash-up duties common to the milk plant. This tank is bigger than any other piece of dairy equipment the farmer uses. In the proposed regulations of one state, the hauler must rinse the tank with cold water immediately after emptying. Then as soon thereafter as possible the producer must wash out the tank with warm water containing a detergent and then rinse. Before again using the tank it must be rinsed with a chlorine solution of at least 50 ppm.

7. *Milk Cooling Temperature*—With the use of the refrigerated storage tank in the producer's milk house, the milk cooling picture changes. With in-the-car cooling most sanitarians talked in terms of 50° and 60° F., but now the situation has changed. It appears that it is not difficult to cool the milk to 38°–40° F. with considerable rapidity after it is in the tank. In one set of regulations examined, cooling must be below 50° within one hour after milking, and then held in the tank at not over 40° F. until it is collected.

8. *Training of the Milk Truck Driver*—As was pointed out earlier in this report, the milk truck driver now occupies a much more prominent place in sanitary milk control. With 200 or more gallons of milk to be loaded from one storage tank, too much is at stake to countenance carelessness and slipshod methods. In the report of one milk company was the statement that their recovery room men were now being used on the tanker trucks because of their knowledge and experience in checking milk for flavor and sediment, and in sampling. It would appear that this is an area for real service on the part of control officials. The training of these men will become increasingly important as this type of milk transport expands. They will be real allies in a program for better milk.

There are many details involved in this whole area of milk handling which have not been touched upon in this report. The problems presented are new and of considerable magnitude. An attempt has been made to point up some of the highlights and to admonish milk control officials to be alert to this new development, and to devise reasonable regulations for the guidance of all concerned. It is believed this system has noteworthy possibilities for improving the sanitary quality of fluid milk.

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Vector Control*

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THE purpose of the Committee on Vector Control of the Engineering Section of the American Public Health Association is to study the status of vector control activities in the United States; to analyze administrative and technical problems and practices in this field, and to prepare reports and recommendations concerning these subjects. Because of the diversity of vector control activities and their inherent interdependence with other health activities, it would seem that in future years joint studies and reports with other committees of the Association might be indicated.

We are thinking of vectors as "animal carriers of disease and discomfort to man." In developing our report, the major emphasis has been devoted to arthropods and rodents because of the proportionately greater amount of control activities against these vectors. It is not our intention, however, to exclude others from the area of general consideration.

Vector control activities have increased greatly in scope during the past 25 years, both in terms of the extent of the area covered and in the types of problems undertaken for solution. The growth in interest on the part of state and local health agencies has been steady if not spectacular. This increasing interest by health agencies has been shared by a diversity of other public agencies, as well as by the commercial operators. The number of agencies operating in the field may result at times in some confusion and even duplication of effort.

We interpret this trend as being associated with departure from the disease-specific type of approach and the acceptance of a broader base of operations. The avoidance of excessive fragmentation of responsibility can best be achieved by recognition on the part of health agencies of the need for broadening their program and assumption of a greater degree of leadership. Protective measures against the viral encephalitides, Rocky Mountain spotted fever, gnat-borne conjunctivitis, fly-vectored enteric infections, high densities of pest mosquitoes and biting flies, and similar activities should be made the modern counterparts of the older malaria, yellow fever, typhus, plague, and other vector control programs.

Enabling legislation is important to further growth in the field of vector control. The development of adequate generally applicable principles would be a logical step in the direction of providing a satisfactory basis for further action by all of the states and by affected communities. Licensing laws for commercial pest control operators also need wider application.

Public awareness of the benefits of vector control and nuisance abatement has been greatly accelerated by the acclaim given to modern chemicals during recent years. While these technologic advancements are of real significance their use is not without accompanying problems, such as resistance to insecticides. Therefore, fundamental reliance must continue to be placed on basic

* First Report of the Committee. Committee on Vector Control. Organized 1950.

methods, including sanitary methods of garbage and refuse disposal, drainage, ratproofing, and similar concepts.

VECTOR CONTROL ACTIVITIES IN THE UNITED STATES

I. *Introduction*

The establishment of a Committee on Vector Control in the Engineering Section of the American Public Health Association is timely. Vector-borne diseases are present in every state, territory, and possession of the United States. This year, coinciding with the formation of our committee, a serious outbreak of mosquito-borne encephalitis has occurred in California, involving approximately 660 cases and 46 deaths (up to October 3, 1952) in an area comprising 30 counties located in the central valley of that state. This epidemic serves as a grim reminder to the public health profession that barriers against vector-borne diseases are vital to our welfare and that they must constantly be maintained and strengthened as the country develops. In undertaking its duties during this initial year of its formation, the members of the Committee on Vector Control decided that it would be appropriate first to survey the present status of vector control activities of the United States. This has proved to be a considerable task. Our report is not as complete in every detail as we would like it to be. However, we hope that the efforts of the committee will serve to focus attention on this increasingly important field with which health authorities are becoming more and more concerned as new problems unfold.

II. *Brief Historical Background*

References to the annoyance caused by insects may be found throughout recorded history. References even are found in the Bible.

The incrimination of vectors as a source of spread of infections followed the acceptance of the germ theory of disease. This occurred during the latter part of the nineteenth century.

In the years that followed, military and civilian health practices were modified to include antivector activities to prevent the spread of such diseases as malaria, yellow fever, plague, and dengue fever.

Field investigations supplemented by laboratory research gradually matured into large-scale control programs. These programs received official sanction and financial support from county and state agencies.

III. *Present Status*

Vector-borne diseases, which occur in severe intensity in various parts of the world, may be a primary socioeconomic factor limiting the amount of local resources available for vector control. For this reason, vector control in the warm climate areas of the world, outside of the United States, is carried on almost exclusively by central governments, either national or provincial, with neither local governments nor private groups or individuals playing a very significant role. In the United States, when malaria and other vector-borne diseases were dominant public health problems, governmental agencies in general carried out the bulk of control activities in the more seriously affected areas. However, because of their greater economic resources, local governments were more actively involved in this country than in tropical countries.

A basic reason why vector control activities are conducted by governmental agencies is related to the behavior of many vectors. They can and do travel relatively long distances from their breeding grounds. This mobility gives both the problem and its control a community-wide and often multicommunity aspect, and favors action by government rather than by individual owners or householders. The area-wide approach is valid in dealing with both

disease vectors and nuisance problems. Generally, control and the motivation for control by individual citizens or their private agents becomes feasible only when arthropods and other vectors harbor within the premises in which they originate.

A. *Legislative Status*

In the United States, since vector control is primarily managed on a decentralized basis, rather than by the central government, consideration of legislative developments becomes pertinent. Laws concerning this subject are on the statute books of almost every state and territory. Even the most casual review of existing legislation indicates that existing laws are extremely divergent and complex. In a few instances conflicts appear to exist. Actually, many of the significant provisions are contained in regulations that have been adopted by boards of health to implement the basic statutes.

Laws and regulations on the subject are of several types:

Type 1—Those concerned with regulating the actions of private individuals, private enterprises, and public utilities. These require measures designed to prevent, correct, or abate the breeding and harborage, or both, of mosquitoes, pests, and vermin, and the licensing of pest control operators.

Type 2—Enabling legislation authorizing the formation of mosquito control districts, drainage, or other water control districts, or providing appropriations for the subvention of local or state governmental organizations with state or federal funds, establishment of state or federal experiment stations, etc.

Type 3—This type consists of less formal regulations instituted by governmental agencies for internal management, and which relate to the prevention or abatement of similar conditions in places under the jurisdiction of the agencies themselves. Examples include state highway department specifications to avoid water-holding borrow pits and internal operating rules to effect control of mosquitoes, rats, and other vermin by such organizations as the U. S. Bureau of Reclamation, U. S. Corps of Engineers, U. S. National Park Service, and the Hospital Division of the U. S. Public Health Service.

Type 1—Regulatory Legislation—Since all arthropods and vermin originate on public or private property of some sort, no solution to this problem seems simpler in theory than the passage of a law or regulation prohibiting all undesirable conditions. In practice, legislation of this type possesses value only when the extent of the problem is minimal. When violations are the exception rather than the rule, and when property owners possess the resources to undertake the indicated control measures, effective regulation becomes feasible. Since the problem is diminishing in some areas and as present economic conditions are generally good, current prospects are favorable to legislation and enforcement as a solution, particularly to urban phases of these problems in the United States. An example of this is "fundamental ratproofing" for new commercial and multifamily residential construction.

The licensing of commercial pest control operators by states and municipalities is growing in extent. It is generally framed and administered to protect the public from the misuse of poisons hazardous to human health, rather than to insure the proper accomplishment of pest control work. Under prevailing conditions, private owners and operators of property are being held increasingly responsible for correcting pest nuisances in urban areas.

The impounded water regulations of state health departments deserve special mention. Following special studies made by the U. S. Public Health Service and the health departments of the southern states regarding malaria caused by the improper development of impoundages, regulations were adopted by some 15 state boards of health. Though originally concerned with malaria vectors only, the present trend, properly, is to broaden them to include other species.

At the same time, the rise in irrigation development in the 17 western states, and in Arkansas, Louisiana, and Florida, has created a need for broadened water control regulations relating more specifically to water distribution and use, as well as to a wider variety of mosquito species. The existence of important unsolved problems, in connection with the 30 million acres now included in irrigation projects, emphasizes the fact that corrective action is overdue. It is estimated that about 50 million acres can be irrigated.

Reclamation hence implies serious threats to the welfare and economy of irrigated areas. These involve the increasing incidence of mosquito-borne encephalitis and the nuisance created by intolerable densities of pest species. At the present time little or no personnel provisions exist in most states for dealing with this critical and growing problem.

Type 2—Enabling Legislation—The expansion of enabling legislation, authorizing the formation of local vector control districts or otherwise providing legal authority for conducting field operations, is one of the greatest needs. Thirty states have legal provision for the establishment of drainage districts. These generally are related to land reclamation and to other agricultural problems. Public health benefits may serve as an added inducement for the formation of drainage districts, but the authority and extent of jurisdiction usually are not adequate for mosquito control activities. About 14 states have laws authorizing county or district mosquito abatement organizations. One of the most serious deficiencies of existing legislation is the unrealistic limitation of the geographic area over which control operation appropriations may be expended. As has often been stated, mosquitoes—or other vectors—do not recognize district or county boundary lines.

The statutes of one state provide for the establishment of local tick abatement districts in connection with Rocky Mountain spotted fever control. Another state law authorizes "pest-inspection" districts. So far as can be determined from a review of existing legislation, there are no state laws that specifically authorize the formation of fly or rodent ectoparasite abatement districts or organizations.

Comprehensive and detailed studies are needed to assist in the development of generally applicable basic principles for the guidance of interested states and communities. These should be sufficiently broad to be applicable to most, if not all, vector control problems. Enabling legislation has the advantage of permitting communities to organize to meet their own problems. This stimulates and preserves the spirit of "self-help."

Type 3—Internal Regulations—A detailed analysis has not been made of the many rules and regulations concerning vector control activities which have been promulgated by the various agencies having jurisdiction over public lands, facilities, and institutions. There are a great many that have provided good abatement measures. The greatest problem concerning vector control operations in this area of jurisdiction is that most of the operations are performed, not by personnel skilled in antivector operations, but by personnel to whom vector control is merely an added duty. For this reason, education and training are essential to the development of effective control programs.

B. *Administrative Status*

1. *State Government Activities*

The First Edition of *Public Health Bulletin No. 184,* showing state health activities in 1929, lists 8 states and Puerto Rico as participating actively in antimosquito measures directed specifically at malaria. The following

states were mentioned as conducting activities and having personnel assigned to malaria control: Alabama, Arkansas, California, Georgia, Illinois, Louisiana, Mississippi, and South Carolina. The principal specific malaria control program items listed in the state programs in 1929 were: impounded water regulations; consultative and advisory service to local malaria control projects; supervision of control activities; and promotion of local county or parish programs. In that report no mention is made of rodent-borne disease control activities conducted by state or territorial health departments with the exception of California and Hawaii. Hawaii also carried out mosquito control activities directed at pest mosquitoes and against the vectors of dengue fever.

In 1932, the Second Edition of *Bulletin No. 184* listed 12 states in which the health agency carried out malaria control activities. This constituted a 50 per cent increase in 3 years.

No change was indicated in rodent-borne disease control activities from 1929 to 1932.

RESPONSIBILITY OF STATE AGENCIES

Striking developments in the assignment of responsibility took place during the succeeding 11 years. The number of state health departments with responsibilities for malaria control in 1943 had more than doubled to 28, and 23 had the responsibility for conducting pest mosquito control operations. Sixteen state health departments, instead of 2, reported rodent and rodent-borne disease control programs. Table 1 shows the distribution of selected health services in the structure of state governments in 1943.

Noteworthy is the fact that so-called "pest mosquito" control was being given increased recognition by state health agencies. Undoubtedly, this development is, in part, attributable to the incrimination of "pest" species of mosquito in the transmission of disease, particularly the viral encephalitides. In part, it is due to the broadening of public health programs toward the goal of total well-being, not merely of the absence of disease.

At the same time, health services provided by state governments for their citizens were being dispersed to a greater number of agencies in the structure of state government. In 1943, 23 state agencies, other than health departments, had responsibilities in the field of vector control. In 13 states, programs were being carried out by health departments jointly with one or more other units of state government.

The 1950 edition of publication No. 184 shows that with the exception of 5, all states reported designation of a

TABLE 1

1943 and 1950—Department of State Government Responsible for Vector Control and Related Activities (Covering 53 Jurisdictions: 48 States, 2 Territories, 2 Possessions, and the District of Columbia)

	Malaria Control	*Pest Mosquito Control*	*Mosquito and Other Insect Control*	*Rodent Control*		*Garbage Collection and Disposal*	
	1943	*1943*	*1950*	*1943*	*1950*	*1943*	*1950*
Health Department	28	23	33	16	49	37	52
Agriculture Department	..	3	8	2	5	..	1
Special Board	1	..	2	2	2	..	..
Conservation Department	..	..	6	..	2	..	..
State University	1	..	10	..	8	..	1
Other Agencies	4	7	3	..	2	3	2
Split and Joint Responsibility	5	4	20	2	15	2	4

Sources: *Public Health Bulletin No. 184*, 1943, and 1950 editions.

specific unit of government as being responsible for the various forms of vector control.

The number of health departments with responsibilities for vector control activities from 1943 to 1950 showed a modest increase, more in rodent control than in antimosquito work. During this period, the number of state vector programs under nonhealth agencies rose from 23 to 52. Another evidence of dispersal of responsibility is indicated in the reporting of 39 instances of split or joint responsibility for vector control work and related programs.

2. *Commercial Vector Control Activities*

Pest Control Operators—The pest control or exterminating industry constitutes an important medium for vector control operations. In recent years there has been continuous progress, both technically and ethically, in this industry. Much credit for these developments is due to the efforts of the National Pest Control Association as well as to leading pest control firms.

There are approximately 1,900 pest control firms, employing about 9,000 individuals, in the United States and Canada which perform commercial vector control work. A total of 1,297 business entities (individual companies or branch offices of the larger organizations) are members of the National Pest Control Association. The industry does an annual business of approximately 68 million dollars, excluding the control of termites or other wood destroying organisms and other nonvector control activities.

An increasing number of entomologists, sanitary engineers, sanitarians, and other professionally qualified individuals are being employed within the industry for responsible technical and managerial positions. Partly as a result of this, but also as a result of a growing awareness within the entire industry of the fundamental importance of basic sanitation in any insect and rodent control endeavors, commercial pest control operators in general are concerning themselves not only with the application of insecticides and rodenticides, but also with the elimination of those insanitary conditions which are conducive to the harborage and breeding of insects and rodents.

Through the efforts of the National Pest Control Association, various colleges and universities, state health departments, and the Public Health Service, insect and rodent control short courses are held. These are attended by representatives of pest control concerns. It is estimated that about 70 per cent of the supervisory personnel in the pest control industry have attended one or more such short courses. Several universities are now offering curriculums specifically designed to produce professional pest control personnel or are offering special courses in the theory and practice of pest control as part of their general curriculums. Some pest control firms are also developing inservice training programs for their personnel.

3. *Federal Agency Activities*

Federal agencies, with responsibilities relating to vector problems, devote more attention to research and the promotion of control than to conducting actual field operations. Notable exceptions to this generality are the vector control activities of the Tennessee Valley Authority and the U. S. Corps of Engineers operating impounded water projects.

The Public Health Service, through the Communicable Disease Center, conducts a variety of laboratory and field investigations directed toward improving the effectiveness of vector control activities and reducing their cost. It also is engaged in epidemiologic-biologic studies to determine the importance of various known and suspected species as

vectors. From this and similar research endeavors will come the clues leading to vector control operations in future years.

The Communicable Disease Center currently is carrying out cooperative demonstrations for the control of flies, rats, rat ectoparasites, and mosquitoes. The promotion of improved practices of refuse and garbage collection and disposal and insanitary privy elimination are carried out jointly by the Communicable Disease Center and the Division of Sanitation of the Public Health Service.

An important phase of the work of the Public Health Service relates to the dissemination of technical information and the conducting of training courses for public health personnel. For example, during the past 5 years 137 courses, involving over 2,900 trainees, have been held to provide intensive indoctrination in modern methods of vector control. A majority of persons attending these courses were employees of state and local health departments.

As has been noted, the Tennessee Valley Authority appreciated the health implications inherent in the creation of its regional water and land resources developments which involve over 600,000 acres of impoundments having over 10,000 miles of shore line, plus substantial agricultural and industrial development. Of particular interest from the administrative viewpoint was the absolute necessity for the integration of malaria control with other reservoir activities such as water level management, land utilization,[1] and industrial development. It was also necessary for the approach to malaria vector control to be in harmony with the various laws and regulations governing the impoundage of waters in the states in which TVA reservoirs are located.

An example of collateral interest in vector control is illustrated by the responsibilities of the Fish and Wildlife Service of the Department of the Interior in the field of rodent control. The Fish and Wildlife Service operates under a general policy of conducting demonstrations and supplying technical aid to cooperating agencies; it conducts investigations to improve control methods and materials.

Vector control activities are conducted at Army, Navy, Marine, and Air Force installations for the health protection and general welfare of resident military personnel. Generally, these operations are confined to federal property itself, but where necessity demands, cooperative arrangements exist with responsible local agencies.

The principal emphasis of the Bureau of Entomology and Plant Quarantine, Department of Agriculture, is on research relating to agricultural insects. However, a division of this bureau is devoted to investigations of insects which affect men and animals. Considerable attention is given to mosquitoes, lice, and ticks.

IV. *Scope of Vector Control*

A. *Extent and Magnitude of Vector Control*

What is the present extent of vector control? The answer hinges on a definition of what vector control is. Community-wide refuse collection and disposal is a basic method of housefly and domestic rodent control. Total annual expenditures for this purpose alone amount to hundreds of millions of dollars. Building codes requiring permanent construction for all or some types of buildings is a basic step toward domestic rodent control. Probably every local government carries on mosquito control to some extent. This ranges from the maintenance of public drains and the application of larvicides to the construction of catch basins for mosquito control and to large-scale tactical attacks involving the annual expenditures of many hundreds of thousands of dol-

lars. Many commercial pest control operators are located in the larger communities. Millions of householders attempt domestic vector control activities in their houses and on their premises.

To some people, community-wide vector control means direct attacks (which convey no corollary benefits) against insects and rodents and which have been so recently adopted that they have not lost their identity in public consciousness through absorption into routine municipal services. Thus, the use of fogging machines to kill mosquitoes and flies or DDT dust to kill rat ectoparasites is considered to be "vector control," while municipal refuse collection and disposal is not so considered. In some communities which have long operated sanitary landfills, no connotation of vector control is ascribed; in others

TABLE 2

Vector Control Activities Reported by State Health Departments to CDC—USPHS September, 1952

	Number of Projects				*Annual Expenditures*		
	Municipal	*County*	*District*	*Total*	*State*	*Local*	*Total*
Alabama	64	10		74			
Arizona	3			3		34,400	34,400
Arkansas	18		21	39		173,332	173,332
California	5	12	48	65	460,000	2,346,000	2,806,000
Colorado	266			266			
Delaware	2		1	3	50,000	7,500	57,500
Florida		18	21	39	291,107	975,700	1,266,807
Georgia	27	11	26	64	18,000	348,705	366,705
Idaho	12			12			
Illinois	350		9	359		431,051	431,051
Kansas	50			50		11,000	11,000
Kentucky	31	11		42	6,500	20,200	26,700
Louisiana	194			194		486,000	486,000
Maryland	6			6		52,600	52,600
Massachusetts	19		8	27		202,000	202,000
Michigan	41			41		100,000	100,000
Nebraska	92			92		47,945	47,945
New Hampshire	3			3		1,300	1,300
New Jersey	4	2	15	21	75,000	1,030,500	1,105,500
New Mexico	3			3	10,500	17,000	27,500
New York	2	1	4	7		1,066,000	1,066,000
North Carolina	14	12	1	27		168,000	168,000
North Dakota	76			76			
Ohio	70		1	71		167,118	167,118
Oklahoma	92			92			
Oregon	1		3	4		78,924	78,924
Pennsylvania	300			300	6,000	219,900	225,900
South Dakota	23			23			
Tennessee	70	22		92		172,600	172,600
Texas	76		3	79		111,000	111,000
Utah	46		5	51		172,634	172,634
Virginia	11		15	26	48,540	216,660	265,200
Washington	17			17			
Totals No. of States—33	1,988	102	178	2,268	$965,647	$8,485,435	$9,451,082
Mosquito	528	57	140	734	870,647	7,269,285	8,139,932
Flies	681	1		682	17,000	207,900	224,900
Rodent	466	20	26	512	18,000	353,553	371,553
General Insect Control	199			199		49,945	49,945
Miscellaneous	114	24	3	141	60,000	604,752	664,752

this procedure is adopted for that specific purpose. To many persons, vector control means an area-wide, specially organized program of insect control, exemplified by the large-scale mosquito abatement districts authorized by state legislation and created by local action.

In a recent request for information about vector control activities within the states, directed to state health departments by the Communicable Disease Center, U. S. Public Health Service, data were supplied about activities directed against the following arthropods and rodents: mosquitoes, houseflies, black flies, greenhead flies, roaches, ticks, rats, mice, wild rodents, and rodent ectoparasites. In nearly all cases these programs were locally financed and were established for the prevention of disease and the improvement of the general welfare of the community. Reports were received from 33 states. (Table 2).

The data submitted do not fairly reflect all vector control activities for these states, either on a relative or absolute basis. Information on expenditures is particularly incomplete and was supplied for less than one-third of the projects reported, but totaled nearly 9.5 million dollars. The extent of activity (number of projects) by states not only indicates the relative adequacy of data on municipal activities in state health department files but also the definition of what constitutes vector control. Although two states included a total of 53 landfill projects and listed "garbage improvements" coincident with other rat control measures, in only one instance were refuse sanitation activities listed as separate projects or included in any of the expenditure records. This exception comprised 27 municipal sanitary landfills with annual expenditures of $229,752. Expenditures reported include federal funds aggregating about $25,000 which are included within state totals and comprised special diarrhea and dysentery operational studies in municipal fly control.

Review of activities by category indicates that mosquito control is the predominant activity in terms of number of projects (734), but is closely followed by municipal fly control (682 projects). The extent of both activities is enhanced by the 199 general insect control projects which were predominantly concerned only with the combined control of mosquitoes and flies.

By number, municipal projects comprised 87 per cent of the total, but the larger and more significant projects tended to be county-wide and district-wide, with a few noteworthy exceptions.

B. *Recent Extent of Programs Under State Health Departments*

The recent extent and growth of vector control activities conducted by state and territorial departments of health can be judged from the summaries in Table 3 of annual reports showing the number of jurisdictions which were engaged in specific elements of vector control programs in the specified years.

Two-thirds of the 53 health departments were engaged in 8 of the above 17 items in 1951. There was more uniformity in coverage of the items pertaining to rodent control and garbage collection and disposal than in those covering malaria and mosquito control activities. When analyzed by geographic area, it appears that the southeastern and Pacific Coast states most consistently are conducting a majority of the elements of vector control.

C. *Local Garbage and Refuse Collection and Disposal Activities*

The efficacy of refuse collection and disposal operations usually has a direct bearing on certain vector control problems. This is particularly true with regard to rodents and flies. Programs of many full-time local health depart-

TABLE 3

(Total Number of Jurisdictions—53)

	No. Engaged in Activities Each Year		
	1943	*1948*	*1951*
Malaria and Mosquito Control			
Surveys of prevalence and distribution of malaria	11	32	34
Participation in or financial support of mosquito control	16	26	26
Supervision of control of malaria	N.A.*	25	26
Entomological evaluation of effectiveness of control	N.A.	23	28
Training of professional personnel and lay public concerning malaria	N.A.	35	30
Promotion of mosquito abatement districts	N.A.	19	19
Direction of local mosquito abatement projects	N.A.	22	29
Investigations of pest mosquito problems	6	27	39
Rodent Control			
Surveys of rodent population	N.A.	N.A.	36
Collection and examination of ectoparasites	N.A.	31	35
Training and education activities	6	17	30
Promotion of local rodent and ectoparasite control projects	N.A.	39	40
Organization of local rodent and ectoparasite control campaigns	8	39	43
Garbage Collection and Disposal			
Promotion of improvement of garbage control practices	3	N.A.	30
Inspection of garbage disposal facilities	5	48	51
Approval of construction plans of garbage disposal	10	24	27
Advisory service regarding garbage collection and disposal	16	51	51

* Not Available

ments include either regulatory or promotional functions aimed at improving garbage collection and disposal. Since the sanitary disposal of garbage is important to adequate general vector control, a summarization of garbage disposal activities from the *Report of Local Health Resources—1950* will indicate the effect of these activities on vector control.

Information available as of December 31, 1951, indicates there were 1,293 full-time health organizations providing local health services in the United States. These units serve 1,542 counties and include 276 cities. The number of people residing within areas having full-time health organizations includes over 70 per cent of the nation's total population.

Utilizing state standards in regard to approved refuse collection and disposal systems, about 85 per cent of the nonfarm population residing within full-time health jurisdictions was served by approved systems. All of the nonfarm population was served by such systems in over one-fifth of the health jurisdictions, and in another one-fifth none of the nonfarm population was served by approved facilities of this type.

D. *Production of Insecticides and Rodenticides*

Production or sales of insecticides and rodenticides may be used as a partial measure of the magnitude of this field of endeavor. With minor exceptions most of the vector control chemicals which are in extensive use today were commercially unknown 10 years ago. The intensive research to increase the health protection for our military personnel while engaged in foreign operations has resulted in better protection for civilians. The continuation of investigations by government agencies and industry since the end of World War II has further enlarged and enhanced the types of chemicals used against vectors.

It seems evident from the foregoing, that vector problems in the United States have many facets. Some of these environmental problems lend themselves

to solution through efforts of individual householders with or without assistance from commercial agencies. Some are well integrated into municipal sanitation practices; while still others are handled as categorical programs dealing with the control of a disease entity or community-wide insect or rodent control. Only a beginning has been made in this report toward analyzing the entire situation. From our study, the conclusion has been drawn that the complex and important activity in this field of public health demands that it be given increasing attention by public health workers.

They should study local needs and facilities and assist in promoting, organizing, and coordinating efforts to eliminate vectors as menaces to the good health and comfort of the public. The problems of pest control are many. Research is constantly solving some of them, but new ones constantly develop. Nevertheless, progress is being made both in procedures and organization. It is recommended that succeeding vector control committees of the American Public Health Association work toward determining how health workers best can participate in and advance this work.

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Archives*

Food and Nutrition Section

THE Forty-sixth Annual Meeting of the American Public Health Association held in Washington, D. C., October 17–20, 1917, brought into existence our present Food and Nutrition Section. Completion of 35 years of continuous activity is ample justification for pausing to consider our origin, accomplishments, and future course. As is so often the case, our early history is characterized by a lack of complete documentary evidence, the absence of which makes it necessary to draw on the memory of your chairman for some of the missing facts.

A most unusual circumstance played a major role in the formation of our Section. The late Lucius P. Brown was food and drug commissioner of the State of Tennessee during the period 1912–1914. As such, he was an active member of the National Association of Dairy, Food, and Drug Officials, an organization which represented the federal and state control of these commodities. About that time, the Health Department of New York City held a Civil Service examination for the position of chief of its Bureau of Food Inspection. Brown took this examination, passed it, and was appointed chief of that division. He joined the American Public Health Association in 1915 and found no forum or established group where food and drug matters could be discussed. As a municipal official, he was ineligible to participate in the deliberations of the National Association of Dairy, Food, and Drug Officials. With his accustomed vigor and persuasiveness, Brown started to develop the interest of the APHA members in food and drug problems. He was ably abetted and supported by the late Dr. H. E. Barnard, food and drug commissioner of Indiana, and Professor James O. Jordan, head of the Milk Inspection Department of the Boston City Health Department.

On October 25, 1916, a special meeting of the American Public Health Association members interested in the public health aspects of food and drug control was held in Cincinnati, Ohio. At this meeting, Barnard read a paper entitled "New Ideas in Food Control." Among other things, Barnard made the following prophetic statement: "the food department whose only effort is exercised for the prevention of food adulteration is occupying a minor field, is letting lie fallow or untilled a world of opportunities. Food adulteration is, save for the occasional lapse of ignorant offenders, a thing of the past. Food sanitation is the work of the present, the nutrition of the human family, the work of the future."

In December, 1916, the Association authorized the organization of a Food and Drugs Section. As might have been expected, Brown was chosen as the first chairman of the new Section and Professor Jordan its secretary. In the interval between the authorization of the Section and its first meeting, various committees were appointed including Committees on Nutritional Problems, the Relation of Foods to Disease, Control of Milk and Dairy Products, Municipal Food Administration, Drugs and Nostrums, Habit Forming Drugs, Cold Storage, Problems of Canning, Retail Distribu-

* Report of the Chairman.

tion and Marketing of Foods, Conservation and Development of Food Supplies, and Preparation, Packaging and Transportation of Foods.

The central theme of our first meeting was the relation of foods and drugs to war problems. A number of distinguished speakers were on this program, including former President Herbert E. Hoover, who at that time was the federal food administrator. The meeting was most successful and evoked the following editorial in our Association *Journal*: "One of the gratifying features of the Washington meetings was the enthusiasm displayed at the sessions of the Food and Drugs Section. The meetings were well attended and the papers well chosen." The following issue of the *Journal* for March, 1918, was largely filled with 17 papers presented at the first meeting of our Section. Our second meeting was held in Chicago, Ill., October 14–17, under the chairmanship of Brown with Jordan still secretary. At our first session the theme was "General Considerations on Wartime Foods." The second session discussed "The Civilians' Food in Wartime." The third session was given over to committee reports and the fourth and final session devoted to "The Soldier's Food." Our third meeting was held in New Orleans, La., October 27–30, 1919, and was largely given over to reports of committees of which, at that time, we had 12.

For a number of years, our programs were largely built around our committee's reports and no joint sessions were held with other sections of the Association. In considering our activities during these and later years, one is impressed with the importance of the reports of our committee on nutritional problems. The first of these reports presented at the Chicago meeting dealt with the quantitative requirements of nutrition. Later reports dealt with such subjects as dried milk; deficiency diseases; the present status of our knowledge of vitamins; mineral elements in nutrition with special reference to calcium and phosphorus; iodine in nutrition; goiter as a nutritional problem; vitamin C; new light on the significance of "protective foods"; the problem of the addition of vitamin D to foods for general use; human requirements of vitamins; food fallacies and nutritional quackery; mineral elements in nutrition; extent of vitamin deficiencies in the United States; present status of clinical tests for vitamin deficiency, and food values in relation to food costs in infant feeding.

We were most fortunate in having Professor Henry C. Sherman as the first chairman of our Committee on Nutritional Problems. He continued until 1937 to give us the benefit of his wide knowledge and experience in nutrition. In those early days, when he presented the report of his committee, standing room in our meeting place was at a premium. When he finished his report, there was a general exodus from the meeting room and more than one chairman had to apologize to the next speaker for the small audience remaining to hear him.

The Association early recognized the value and importance of these reports through an editorial "Food and Health" published in the *American Journal of Public Health* 11:159, 1921. In part, the editorial stated: "For the student and guardian of the public health, the center of gravity of the food problem has shifted from sanitation to nutrition. Broadly speaking, the food supply has been made safe and there now remains the large problem of making it so fully adequate as to insure for all of our people the best possible condition of nutrition, and through this, the highest state of health and the greatest possible vigor and ability to resist disease." After discussing the contributions of Hopkins, Osborne, Mendel,

McCollum, and Hess, the editorial says "the relation of the food supply thus appears through this newer knowledge of nutrition in a much more positive and commanding light. Recognizing this, the American Public Health Association appointed in 1917 a Committee on Nutritional Problems, whose third annual report deals with 'Vitamins and the Relation of These and Other Food Constituents to the So-called 'Deficiency Diseases'." (For references to published reports of the Committee on Nutritional Problems see 13th annual *Year Book*, 1941–1942, p. 105 (Mar.), 1942.)

The first joint meeting of our Section with another was at the 1923 Boston Convention with the Public Health Administration Section. The following year, a joint session was held with the Child Hygiene Section. In 1925 and 1926 no joint sessions were held. Beginning with the 1927 meeting, joint sessions with other Sections of the Association have constituted an increasingly important part of our annual meetings. Reaching a climax in the years 1949 and 1950, we held five joint sessions in each year with nearly one-half of the existing Sections of our Association. Throughout this period, we have had one or more joint sessions with every Section of the Association, with Laboratory, Public Health Engineering, and Maternal and Child Health Sections predominating. These joint sessions have not only been in line with the Association's policy, but have also demonstrated clearly the wide influence of food and nutrition problems on the activities of every section of our Association.

In 1929 the Association authorized the establishment of the Association Committee on Research and Standards. Our first representative on the committee was Professor Henry C. Sherman in 1930. In the several years since its establishment, our Section has been honored by having as many as three representatives on this very important Association committee.

Four years ago, our Association, through its Food and Nutrition Section, was invited by the Food and Nutrition Board of the National Research Council to appoint a liaison representative to that board. The first representative of the Association was Dr. Norman R. Jolliffe who recently has been honored by re-election to full membership on this important committee. Our present chairman, Alice H. Smith, is the current liaison representative of the American Public Health Association on the Food and Nutrition Board.

In our 35 years of activity, the name of our Section has been changed twice. Initially, we were known as the Food and Drugs Section. At the 1929 meeting, nutrition was recognized so that our Section became known as the Food, Drug, and Nutrition Section at the 1930 meeting at Ft. Worth, Tex. Two years later, at the Washington, D. C., meeting in 1932, we acquired our present name of the Food and Nutrition Section.

Throughout our life, we have faced many interesting and even difficult problems. Initially, the nucleus for our Section came from the Laboratory Section. Practically all the well known food bacteriologists in the Laboratory Section transferred to our new Section. In our early years, we had many difficulties in filling the positions of officers of our Section as well as the chairman of our numerous committees. Again, in the mid-twenties, we had a considerable problem in changing our viewpoint on food work from the regulatory to the public health point of view. Still later, another dilemma presented itself in the interest of various Sections of the Association in such commodities as milk and oysters. This situation became so acute that our own Section passed a resolution for presentation to the Association Governing Council requesting that an Association Committee on Milk be established with proper representation

from other sections interested in this important commodity. We also had our problems in connection with the development of standard methods for the examination of milk and dairy products, since most of the Association scientists active in this field were members of our Section rather than the Laboratory Section. Fortunately for all of us, these difficulties were ironed out and were able to unite in a common and general effort to promote the best interests of the American Public Health Association.

It is interesting to note that early in its history, the American Public Health Association was interested in food problems. One of the most important of these was the consideration by an Association committee of the problems of cold storage under the chairmanship of the late Dr. Peter N. Bryce, Provincial Department of Health, Ottawa, Canada. Another Association committee active at that time dealt with the problems of narcotics and drug addiction, under the chairmanship of the late Dr. C. E. Terry, health officer, Jacksonville, Fla. When our Section was formed, both of these committees joined in with our organization and we were fortunate in having the guidance of Drs. Bryce and Terry and also Dr. Hastings, Toronto, Canada, in our deliberation on these problems. Another striking instance in our history was the personnel of our Committee on Nutritional Problems for the first 10 years of its existence. Under the chairmanship of Dr. Sherman, other members were Professor C.-E. A. Winslow, Dr. Isadore Greenwald, Dr. C. L. Fisk, A. G. Woodman, E. V. McCollum, and E. M. Nelson. In fact, our roster of officers, committee chairmen and committee members in those days looked like a page from *Who's Who* in Food and Nutrition.

In the American Public Health Association, as well as in many other organizations, the office of secretary is perhaps the most important office. It is recognized that the success of an organization such as ours and under the constitutional requirements of the American Public Health Association depends on a competent secretary. Our Section has been extremely fortunate in having had but 10 secretaries in its 35 years of life. Our first secretary, Professor Jordan, served for 10 years. Dr. Fellers served for 6 years; Dr. Eichelberger, 4 years; Marjorie M. Heseltine, 3 years and Alice H. Smith, 5 years, with E. M. Pickens, F. C. Blanck, and Helen Stacey serving for one year to date.

For completion of our record, there follows a list of the names of the chairman, vice-chairman, and secretary of our Section from 1917–1952.

It is regretted that limitations of time and space prevent your committee from going into greater detail on our past accomplishments. Again the early records are both fragmentary and difficult to locate. We believe that our Section throughout its career has exercised excellent judgment in its selection of officers, in presenting current problems of interest to the members of the Section, and has done a fine job establishing the importance of food and nutrition in a broad public health program, even extending to the many branches into which that field can be subdivided. What then may we visualize in the nature of future activities of our Section?

1. Increased activity and interest in the development of nutritional surveys
2. Comprehensive studies in the field of geriatric feeding
3. Studies on institutional feeding
4. New food processing methods with special reference to their influence on the nutritive value of foods so processed
5. Current progress in nutritional research
6. New food products
7. Advances in food packaging and marketing from the public health point of view
8. Chemicals in or on foods
9. Public health aspects of frozen food, especially the newer precooked foods
10. Further studies on food habits both from a geographic and nationality basis

Officers, Food and Nutrition Section
1917–1952

Year	*Chairman*	*Vice-Chairman*	*Secretary*
1917	Lucius P. Brown		James O. Jordan
1917–18	" " "	J. P. Street	" " "
1918–19	H. C. Lythgoe	F. C. Blanck	" " "
1919–20	F. C. Blanck	J. P. Street	" " "
1920–21	J. P. Street	R. E. Doolittle	" " "
1921–22	R. E. Doolittle	W. H. Lipman	" " "
1922–23	W. H. Lipman	W. D. Bigelow	" " "
1923–24	W. D. Bigelow	F. C. Blanck	" " "
1924–25	F. C. Blanck	H. W. Redfield	" " "
1925–26	J. C. Geiger	H. W. Redfield	" " "
1926–27	H. W. Redfield	J. H. Shrader	" " "
1927–28	J. H. Shrader	H. C. Sherman	" " "
1928–29	H. M. Loomis	E. V. McCollum	Carl R. Fellers
1929–30	Horatio N. Parker	William B. Palmer	George W. Grim
1930–31	" " "	" " "	" " "
1931–32	William B. Palmer	C. R. Fellers	" " "
1932–33	C. R. Fellers	D. B. Jones	E. M. Pickens
1933–34	Walter H. Eddy	S. C. Prescott	F. C. Blanck
1934–35	S. C. Prescott	F. W. Tanner	C. R. Fellers
1935–36	F. W. Tanner	W. S. Frisbie	" " "
1936–37	W. S. Frisbie	B. E. Proctor	" " "
1937–38	B. E. Proctor	D. B. Jones	" " "
1938–39	D. B. Jones	F. W. Fabian	" " "
1939–40	F. W. Fabian	A. C. Hunter	Marietta Eichelberger
1940–41	A. C. Hunter	Henry T. Scott	" "
1941–42	H. T. Scott	Ira A. Mannville	" "
1942–43	I. A. Mannville	D. K. Tressler	" "
1943–44	D. K. Tressler	Marietta Eichelberger	Marjorie M. Heseltine
1944–45	Marietta Eichelberger	F. C. Blanck	" " "
1945–46	" "	" " "	" " "
1946–47	Charles G. King	Marjorie M. Heseltine	Alice H. Smith
1947–48	Marjorie Heseltine	Harry E. Goresline	" " "
1948–49	Paul Prickett	Margaret Moore	" " "
1949–50	Margaret Moore	Glen Slocum	" " "
1950–51	Glen Slocum	Helen Stacey	" " "
1951–52	Alice H. Smith	Frederic W. Nordsiek	Helen Stacey

11. Further development of community nutritional education and nutritional programs

Our past record is one to which we can point with pride. Our present activity reflects alertness to current problems in the food and nutrition field. Our future growth will show vision and anticipation of tomorrow's needs for a healthier and happier nation and world.

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MARIETTA EICHELBERGER, PH.D.
MARJORIE M. HESELTINE
HARRY T. SCOTT, PH.D.

Field Training in Preventive Medicine*

Health Officers Section

IN reviewing the total problem of the application of preventive medical and public health principles to the disease problems of the country, several areas of need in training are apparent. The first was presented in the report of this committee at the Annual Meeting in San Francisco one year ago. It dealt with the question of entrance requirements to medical schools and suggested the desirability of reducing science requirements so that more hours in the humanities would be possible for the premedical student.

The second need appears to be the introduction and experience the student in medical school has with public health and preventive medicine. If the curriculum and teaching technics are practical for the student, preventive medicine will gain a place in his medical interests. This entire problem is to be the subject of a conference on "Preventive Medicine in Medical Schools" to be held November 3–7, 1952. One of the committees of the conference is assigned the subject of curriculum content and methodology. Following this conference of professors of preventive medicine the Annual Meeting of the Association of American Medical Colleges, November 10–12 will consider "The Place of the Department of Preventive Medicine in Medical Schools." These meetings will determine the recommended curriculum, content, and methodology for teaching preventive medicine. We, therefore, make no recommendations in this regard except to urge: (1) that the teaching of social and community aspects of medicine, including public health, be introduced in the curriculum and have a planned continuity during the medical school experience; (2) that field experience of a practical nature be included to supplement classroom teaching. If this experience is properly developed, it can be an interesting method for physicians in public health practice and the clinical practice of medicine. It may make clear the interrelationships and obligations of the private practitioner and official health agency each to the other.

In reviewing the usual patterns of field experience under this type of program, we find medical students are offered three general types of assignments:

1. Nurses, sanitarians, and other specialized personnel assume primary responsibility for instruction.
2. Clinic activities in the health program take up most of the time.
3. No specific plan is made and apparently students are expected to derive understanding of the principles of public health practice by osmosis.

The committee believes these technics give the student a biased impression of public health and make it difficult for him to properly orient himself with respect to official public health activity. In the first instance, his time in the health agency is spent with professional people other than the doctor. Therefore, understandably, he thinks of public health as a nursing visit or a sanitary inspection. These services having only a very remote relationship to medicine. In the second instance, his impression is one of medical care for specialized groups. The third pattern leaves too much to chance and, as is the case in the previous instances, the student

* Report of the Sectional Committee on Professional Education.

emerges with a distorted and disorganized impression of public health practice.

The committee urges each health officer who accepts medical students for field training to recognize the unusual opportunities offered by this experience. They are:

1. A chance to recruit the interest of students in the field of public health as a career.
2. An opportunity to give a clear picture of the interdependence of public health practice and private clinical practice in their effort to control disease processes at the community level.
3. An experience for broadening the outlook of the physician so he will recognize that a disease process in an individual cannot, etiologically, be separated from the impact exerted on that individual by the complex of environmental forces.

As attractive as is the principle of field experience in public health for medical students, it is better not to give such experience than to give it in a way and under circumstances which will give a biased impression of the field, its medical content and relationships. Therefore, in order to accomplish the above goals it is recommended that field experience programs for medical students embody the following principles:

1. Students should be assigned to the health officer. The relationship of the public health physician as the diagnostician of community health problems and manager of preventive and therapeutic regimes for community ills will be a revelation. The student will be happy to identify his profession in the public health field and recognize a caliber of physicians equal to those whom he identifies with clinical medicine.
2. Students should be given projects which offer opportunities to study the epidemiology of a disease process. This work with the health officer should be aimed at building a satisfactory program of control or prevention. By this method the utilization of other professional and technical personnel and facilities can be understood and their relationship to a specific objective realized. Also, this permits the realization that the disease process is intimately tied in with the ecology of community life and, therefore, that medical problems are fundamental in public health.
3. Field activities should be carefully explained, especially, the basic philosophies and reasons for the particular service. This will insure their identification with a particular program.
4. Administrative responsibilities of the health officer should be indicated in so far as is necessary to:
   a. Achieve an understanding by the student of the process used in diagnosis and treatment of community health problems.
   b. Gain a real respect for effective administration and a recognition of its problems and complexities.

In view of the importance to public health of having medical graduates who have an insight into, and an understanding of preventive medicine and public health, we recommend: (1) that local health officers interest themselves in this problem and lend their cooperation to medical schools interested in providing this type of experience to their students; (2) that this report be made available to the Conference of Professors of Preventive Medicine to be held November 3–7, 1952.

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Accuracy of Health Content of School Textbooks*

School Health Section

THE committee was set up for the purpose of studying selected public school textbooks for their scientific accuracy of health information.

Reviewers—A total of 146 different individuals made 217 reviews of 52 books. By subject fields, the information is as follows: (a) health—101 individuals made 123 reviews of 21 texts; (b) general science—33 persons reported 72 reviews of 28 texts, and (c) biology —12 individuals made 12 reviews of 3 texts.

Extent of errors—The number of errors reported by the 52 teams ranges per book from 2 to 126. By subject field the extent of errors is as follows:

Health: High school texts ranged from 21 to 126 errors with an average of 43 per book or approximately 13 errors per 100 pages. The 7 elementary school books ranged from 2 to 17 errors, an average of 8 per book or about 4 errors per 100 pages.

General Science: These texts had a range of 0 to 31 errors with an average of 14 per book. The number of pages of health content ranged from 28 to 111 with an average of 67 and approximately 20 errors per 100 pages.

Biology: The three books contained 5, 29, and 32 reported errors, or an average of 22 per book. The number of pages of health content was not reported.

Errors classified by health areas—Nutrition ranks high in the percentage of errors reported. The extent of error increases with the age of the book.

First aid also has a large number of errors in terms of the amount of space devoted to the subject. Many statements were reported as not coinciding with the first aid recommended by the American Red Cross.

Communicable diseases are often inaccurately discussed, particularly in relation to topics such as immunization, vaccination, and drugs. This point applies in particular to general science texts. In the field of sanitation, an average number of errors is reported.

The committee concluded:

1. This study of the scientific accuracy of the health content of textbooks shows that errors of various types and degrees exist.

2. Care is needed in reviewing textbook manuscripts for their scientific accuracy. The number of authors of a given text seems to have little bearing upon the extent of mistakes. Therefore, in the selection of reviewers for the manuscript, consideration must be given to obtaining adequate coverage of the various health fields represented by the book.

3. Due to the scientific advances and the accompanying changes in the field of health, a sufficiently large amount of the health content of textbooks tends to become outmoded, inaccurate, and obsolete in time. Therefore, publishers need to revise and the schools need to replace textbooks sufficiently often to meet this problem.

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* Report of the Committee.
COMMITTEE ON HEALTH CONTENT OF TEXTBOOKS.

Training in Medical and Public Health Statistics*

Statistics Section

THE appointment of the present committee by the Statistics Section of the American Public Health Association was prompted by the increasing recognition given to the role of statistics in the medical curriculum and by the shortage of trained specialists in medical and public health statistics. The committee has undertaken a twofold task: (1) a consideration of the training in statistics needed by medical students and by public health students who are not specializing in statistics, and (2) a consideration of the training needed by specialists in medical and public health statistics. The work of the committee has consisted largely of surveying the current status of teaching and training programs and of collecting the opinions of its own members and of other correspondents with respect to these problems.

MEDICAL STUDENTS AND PUBLIC HEALTH STUDENTS

We may consider first the matter of what statistics should be given to the medical and public health students whom we do not expect to make statisticians. Rather, we expect them to become familiar with the statistical approach, a new way of thinking for most of them. For guidance with many of their problems, they must still turn to a professional statistician.

The statistics taught to this group of students (or to any group, for that matter) should not consist of merely a group of ready-made technics. Rather, it should be presented as a procedure for elucidating problems. The important issues seem to be the careful definition of questions which the data are expected to answer, the choice of scales of measurement, and the avoidance of bias in the collection and analysis of data. This embraces the principles of correct design of experiments and surveys, the principles of proper presentation of data, and the methods of analyzing data (including correlation methods). Consideration is to be given to the part that chance may play in producing observed differences, including the role of significance tests. These tests are not to be presented as simple recipes for drawing conclusions, however. The avoidance of fallacious reasoning is the theme which permeates the whole teaching structure. The statistical approach will usually be presented in terms of familiar problems, priority being given to those problems faced most often by the professional group addressed.

CURRENT STATUS OF INSTRUCTION IN STATISTICS TO PUBLIC HEALTH STUDENTS

The training in statistics acquired by public health students is generally obtained by spending one or more years of postgraduate study at one of the schools of public health. The matter of in-service training or of short orientation courses for nonstatisticians was not ex-

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* Report of the Committee.
COMMITTEE ON TRAINING OF MEDICAL HEALTH STATISTICIANS.

plored by the committee. In general, the statistics currently taught to public health students are in line with the considerations outlined above. Practically all students take at least one course in vital statistics or biostatistics in which are discussed the statistical issues related to public health in terms of collection of data, tabular, and graphical presentation, and simple analysis in terms of averages, percentages and rates. Most students are exposed to the concept of chance variation and the role of significance tests. A consideration of long-term studies involving the peculiar difficulties of follow-up data also is usually included. Substantial emphasis is put on the solution of actual problems in the laboratory part of the course. Occasionally there may be practical work in health departments. In addition, opportunities are generally available for the worker to pursue further studies in statistics, if he so desires.

CURRENT STATUS OF INSTRUCTION IN STATISTICS TO MEDICAL STUDENTS

The most informative part of the work of the committee relates to a survey that was made of the instruction in statistics given to medical students. A questionnaire was sent to the 90 medical colleges in the United States and Canada. Complete returns are available on 82.

About 7 out of 8 schools (67 out of 82) now include instruction in biostatistics as part of their undergraduate medical curriculum.* Of the 67 schools, 38 report that the course is primarily a course in biostatistics; while in 29 cases the biostatistics is incidental to some other subject matter. The instruction is often (21 schools) included in a course titled "Preventive Medicine and Public Health," but 28 schools have courses frankly designated "Biostatistics" or "Medical Statistics," while a scattering of other schools use such titles as "Quantitative Methods," or include instruction in statistics in a course on physiology, biochemistry, etc. The sponsoring department is overwhelmingly public health and preventive medicine (in 45 of the schools), reflecting the ancient history of statistical methods in medicine. In the other schools the course is scattered throughout nearly all departments, physiology being the most popular. About half the schools report that instruction in biostatistics is presented in more than one course, with pharmacology and physiology being the most frequent other courses in which such instruction is given.

Most of the schools consider biostatistics as part of the basic science curriculum and give it in the first or second year. The course is usually required for all medical students. Class time devoted to biostatistics ranges from none (15 schools) to 50 hours, distributed asymmetrically with a mean of about 15 hours. Sixteen of the schools give more than 25 hours. Lecturing is the method of instruction used most frequently. The shorter courses tend to be entirely lectures; whereas the longer courses usually include a substantial amount of laboratory work.

The general aim or purpose of teaching biostatistics was queried but the replies have been difficult to classify. A frequent statement is that the purpose of the course is to help the students to think clearly and critically and to read medical literature critically. "Evaluation of medical data," "quantitative thinking," etc., were popular responses. Somewhat over half of the schools state that the main emphasis and orientation is on basic principles underlying the experimental method and the statistical approach to the judgment of evidence. A smaller number appear to place the main emphasis on learning a few simple

* A survey conducted by Dr. Neal Chilton two years ago showed that only 6 of 37 dental schools in the United States were giving instruction in biostatistics to dental students.

technics of data handling thought to be useful in medical science and practice. Another small group stresses elementary technics as applied in the field of public health practice.

The principal subjects included in the courses were also difficult to classify. Probability, sampling variation, or significance tests appeared in most of the courses (56), as did frequency distributions or descriptive statistics (52). Applications in public health practice appeared in 33 of the courses, data handling—tabulating, computing, graphing, etc.—in 29. Regression and correlation, experiment design, miscellaneous applications in medicine, such as bioassay and therapeutic trials, were each mentioned in 17 courses. Less frequent topics were logic of scientific method, analysis of variance. Only 5 of the courses specifically mention the inclusion of registration and certification of vital events. Presumably this is taught in other courses or not at all, or was inferentially included in the general category of "vital statistics." In somewhat more than a third of the courses reliance is placed on lecture notes and mimeographed syllabi. About a third of the courses use the Bradford Hill text, the most popular single textbook. A few schools use chapters on statistics in books on public health practice, such as Rosenau, Smillie, Shepard, and others.

The rank of instructors assigned to the teaching of biostatistics is generally high, two-thirds being either full or associate professors. This reflects not necessarily the high status of biostatistics so much as the fact that it is so often given as a sideline of a professor of public health and preventive medicine, physiology, etc. Auxiliary personnel participate in some of the courses. Although about two-thirds of the 67 schools are using full-time faculty for the instruction, somewhat less than half of the schools are using persons with full-time interest in biostatistics. The fields of major interest of the remainder range widely with public health leading, with 14, and physiology next, with 5. The academic degrees held by the principal instructors are varied, with M.D. the most common (29). There are 10 courses being taught by persons with advanced (Ph.D.) degrees in biostatistics, plus 5 with Ph.D. in mathematics and 2 in economic statistics. Some schools expressed the sentiment that the M.D. degree, with clinical experience and prestige, is necessary to student acceptance of biostatistics instruction.

The committee and its various correspondents, including many of the faculty responsible for teaching biostatistics to medical students, are in general agreement on a number of issues. It is desirable that all medical students receive statistical instruction. The important issues cannot well be discussed in a course of less than some 25–30 hours. The basic principles of the experimental method and of the statistical approach must be stressed, but there must also be an abundance of practical applications. The committee believes that the teaching should be done by a professional statistician (M.D., Ph.D., or other) well oriented with medical problems. People whose primary interest and concentration is in another field usually do not do the most efficient job of teaching statistics.

There is some evidence that instruction fits better into the second year than the first because of the generally greater emphasis on experimental methods in the second year. While there are certain advantages to placing the instruction in the third and fourth years, where the student encounters more of the current periodical literature and may become more directly involved in research efforts, in these years the clinical subjects dominate the attention and interest of the student. While it is desirable to tie statistical instruction in with the various fields of medicine and to discuss

certain topics as they arise in other courses, e.g., birth certification in obstetrics, too much scattering of the subjects among various departments does not appear to be desirable.

There should be an opportunity for those who want more statistics to supplement the basic course by optional courses and by guidance in the use of the basic principles. The attainment of the desirable goal of utilizing basic statistical principles in all parts of the medical curriculum may be hastened by properly indoctrinating the interns, residents, and faculty, particularly the younger members. In many of the medical centers, facilities are available for pursuing the subject more intensively through schools of public health, departments of statistics, etc. Furthermore, graduate students, teaching and hospital staff do often participate in the biostatistics course or courses. The committee has not explored the training available in clinics and hospitals not associated with medical schools.

One of the greatest deterrents to allotting enough time for an adequate course in biostatistics in some medical schools is the crowding by other subjects. If a biologically oriented course in statistics were one of the required premedical courses as suggested in the Report of the Medical Curriculum Committee of the British Medical Association,* then the time deterrent would be largely removed since previous knowledge would merely have to be supplemented by applications in the subject matter of the medical curriculum. While the committee does not wish to make any such recommendations, it does suggest that a person coming to medical school should have a thorough appreciation of scientific methods and this includes insight into statistical methods.

* *The Training of a Doctor.* London: Butterworth, 1948.

STATISTICIANS IN MEDICINE AND PUBLIC HEALTH

The problem of training professional statisticians for medicine and public health is one on which the committee and its correspondents did not care to be too specific. At present, it seems very much as if a medical or public health statistician becomes one by chance. The question was raised among the committee members as to whether the training of public health statisticians should be considered separately from that of medical statisticians. Much of public health statistics is concerned with collecting and compiling data. Furthermore, the statistical methods used are generally large sample methods, making it possible, although not desirable, to ignore a large part of the modern statistical theory. On the other hand, the statistician in medicine requires thorough grounding in statistical theory appropriate to small samples and experimental design. Nevertheless, the committee is in general agreement that the separation into medical and public health statisticians is undesirable.

The problem of training cannot well be divorced from that of recruitment and thus we shall comment on that score first. We seem to be concerned with attracting two types of people into the field—the person who is not yet a professional statistician and the professional who is in another field of application and has a flair for biostatistics but does not know it. Many of the statisticians presently in medicine and public health were originally in other fields of application, such as engineering, agriculture, sociology, etc. While we cannot do much about finding and guiding the persons already trained, we welcome them with open arms. Our only advice to them is to learn something of the terminology and problems in the field.

Our major consideration here is with the person starting from the beginning.

He may have almost any undergraduate background. It is desirable that he have a sound mathematical background, so that he can absorb statistical theory more easily. While a background in the natural sciences is not a prerequisite, it is certainly a distinct advantage. A background in sociology or other subjects is often quite as satisfactory, however. Usually the broader the background, the more flexible and imaginative will be his applications of statistical methods. In order to attract a sufficient number of people with appropriate undergraduate training into the field, it may be necessary to do some proselyting among the undergraduates, for example, among students in mathematics departments who are also interested in the sciences or among science students with a decided interest in mathematics. Some health departments have been able to find recruits from this group. We do not suggest any form that the planting of seed should assume, and we do not feel that undergraduate courses in biostatistics are necessarily the answer.

In the course of his graduate training, the embryo biostatistician must broaden his field of application, with particular emphasis on the various fields of medicine and public health. This means that he will pursue studies such as physiology, pathology, epidemiology, administration, etc. The aim is to give him a deep enough background so he can examine critically the validity of the basic data, and so that he can establish rapport more easily with his medical and public health colleagues. In addition, he will take formal training in statistics. The committee did not attempt to specify what this training should be other than that it should consist of a series of courses and problems in statistics applied strongly to fields related to medicine and public health, plus generous doses of mathematical statistics and possibly mathematics. Studies in experimental design, sample surveys, statistical inference, population and demography, life tables, administrative statistics would usually be included. The acquisition of the broad training outlined requires study at the doctorate level. While adequate training at the level of the master's degree can usually be acquired by spending from one to two years in a school of public health, training at the doctorate level would usually involve a cooperative arrangement between the school of public health, the medical school, the department of mathematical statistics (or mathematics), and possibly other departments of the graduate school.

In addition to the formal training outlined above, some type of supervised internship or field training should be an important part of the training. In this connection, a good exposure to the duties of a statistical clerk or medical record librarian has a salutary effect. As a part of its task, the committee undertook to see what various state and city health departments were doing in the way of field and inservice training activities. Only 8 of 41 state health departments and 2 of 8 city health departments had training programs in operation. Most of these programs also provide trainees with the opportunity to learn activities and services offered by other divisions of the health department and of local health units, but only a few of the programs provided staff meetings of an informational and instructional nature for the statistical workers.

SUMMARY

1. Statistical methods should be taught to all medical and public health students, but these methods should be presented as a procedure for elucidating problems and not as a series of ready-made technics.

2. The statistics taught to public health students is generally adequate.

3. A survey of current instruction in statistics to medical students shows that, while some statistics are taught in most medical schools, the time allotted is usually too short

and relatively few of the faculty members responsible for the teaching have a full-time interest in biostatistics.

4. The utilization of statistical principles in all parts of the medical curriculum must be encouraged.

5. The training of medical statisticians and of public health statisticians are not considered as separate problems.

6. Definite steps toward the recruitment of suitable people into the field of biostatistics are necessary at all levels of training. Undergraduates with a background in mathematics and the natural and social sciences must be sought and encouraged.

7. A biostatistician should have a broad background of application, including medicine and public health. No single pattern of theoretical training in statistics has been proposed or is necessarily desirable.

8. It is advisable for persons seeking a career in biostatistics to have training at the doctorate level, spending at least one to two years of this training in a school of public health or in some other part of the university, putting substantial emphasis on applications.

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American Public Health Association

STATEMENT OF INCOME AND EXPENSE
January 1 to December 31, 1952
(with some interpretation)

The Association has two types of income, designated as "General" and "Earmarked." Somewhat over one-half of the total income in 1952 was from "General Income" including membership dues, which are available for the operation of the basic services of the Association. In 1952 "General Income" exceeded expenses by $10,576.21. The allocation of "General Income" is the responsibility of the Executive Board.

The rest of the Association income is "Earmarked," since it is accepted for specific projects by the Executive Board and must be expended for the purposes given, under the Board's supervision.

The custodian of all Association funds and properties is the Treasurer. Income from all sources is deposited to the account of the Treasurer and can be withdrawn only upon his signature.

The following statement is published at the request of the Executive Board for the information of the membership.

GENERAL INCOME AND EXPENSE COVERED BY IT

	Income	*Expense*
Income from Membership Dues (all classes)	$132,088.25	
Expense charged against dues income: Rent, maintenance, library service, Sections and Branches; travel of Executive Board and Executive Secretary; membership maintenance and promotion; public relations; auditor; rebates to affiliated societies; Staff salaries		$137,991.24
Income from *American Journal of Public Health*	97,186.86	
Expense charged against *Journal* income: Printing, paper, cuts, mailing; salaries of Editorial staff; Editorial Board travel		104,792.44
Income from Association Publications	30,365.63	
Expense charged against publications income: Printing and distribution; discounts to dealers; share of proceeds to collaborating agencies; salaries		19,319.79
Income from Annual Meeting (all sources)	43,793.12	
Expense charged against Annual Meeting income: Exhibit costs; rental fees; Program Committee and staff travel; programs and registration supplies; promotion		34,964.59
Income from Field Studies	9,621.88	
Expense charged against Field Studies: New York Welfare Study		5,772.15
Income from Miscellaneous Sources (Interest on securities, discounts for cash on accounts payable, etc.)	7,458.47	
Expense—Committee on Research and Standards: Travel; supplies; salaries		3,900.48
Expense—Committee on Professional Education—Including Vocational Counseling and Accreditation: Committee travel; consultation fees; printing and supplies; staff salaries		3,197.31
Total nonearmarked income and expense	320,514.21	309,938.00

EXPENSE COVERED BY EARMARKED INCOME

(Income from grants is identical with expense for each project; unexpended balances are segregated and held over for expenditure in 1953.)

	Income	*Expense*
Subcommittee on Medical Care		$ 34,624.22
Research and studies on methods of administering medical care		
Evaluation of Administrative Practice		5,234.70
Studies on procedural methods in the control of such diseases as pertussis, endemic goiter and typhoid fever		
Subcommittee on Nutrition Practices (C.A.P.)		5,163.35
Study of nutrition services at federal, state and local levels		
Accreditation of Field Training Areas		12,078.95
Subcommittee on Hygiene of Housing		12,034.22
Studies and promulgation of principles of and standards for healthful housing		
Professional Examination Service		116,371.87*
Preparation of materials for examination of candidates for public health positions; development of examinations for American Board of Preventive Medicine and Public Health and for Division of Commissioned Officers of the Public Health Service; field consultation in use of examinations and on problems of personnel administration		
Engineering Section Project		8,264.55
Research in administration of environmental sanitation programs; consultation on curricula; personnel placement		
Lasker Awards		6,219.23
Processing of data on candidates and recipients		
Association Committee on Child Health		19,227.49
Compilation of standards; study of possible use of health department facilities for training of physicians		
Total Earmarked Income and Expense	$219,218.58	$219,218.58
GRAND TOTAL OF INCOME AND EXPENSE	$539,732.79	$529,156.58

* Includes fees for service.